5-4310-277-14

TM 5-4310-277-14

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

COMPRESSOR, RECIPROCATING AIR, 15 CFM, 175 PSI, TANK MOUNTED, GED, (CHAMPION PNEUMATIC MODEL HGR5-8M-1) NSN 4310-00-880-0186

COMPRESSOR, RECIPROCATING AIR, 15 CFM, 175 PSI, TRAILER MOUNTED, GED, (CHAMPION PNEUMATIC MODEL BGR-5M-1) NSN 4310-00-852-1745

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1976

D 101.11:

READEX FICHE best copy available

Reproduced from poor document.

SAFETY PRECAUTIONS

WARNING

Pay particular attention to specific cautions and warnings throughout this manual.

DEATH

or severe burns or injury may result if personnel fail to observe safety precautions.
Do not smoke or use open flames that may ignite the fuel vapors
while gasoline tank is being filled.
Always maintain metal to metal contact when filling the fuel tank.
Do not attempt to fill fuel tank when compressor is running.

DANGEROUS GASES

are generated as a result of operating this equipment.
Do not operate compressor in enclosed areas unless exhaust gases
are properly vented to the outside.
Exhaust discharge contain noxious and deadly fumes.
Be extremely careful when using carbon tetrachloride fire
extinguisher in an enclosed area.
A poisonous gas is generated by the contact of carbon
tetrachloride with a heated metallic surface.
Provide adequate ventilation before entering the enclosed
area where carbon tetrachloride has been used.

CAUTION

DAMAGE

to the equipment may result if personnel fail to observe safety precautions.
Be sure that all guards and shrouds are in place before starting the unit.
Never attempt to service any of the air compressor components until
the engine is stopped and the unit is relieved of all air pressure.

WARNING

This compressor is NOT SUITABLE for the supply of
air for charging cylinders with BREATHABLE AIR.

WARNING

Operation of this compressor presents a
NOISE HAZARD to personnel in the area.
The noise level exceeds the allowable limits for unprotected personnel.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts
is potentially dangerous to personnel and property.
Avoid repeated and prolonged skin contact.
Do not use near open flame or excessive heat.
Flash point of solvent is 100° F. (38° C) —138° F. (59° C.).

TM 5-4310-277-14
C1

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY,
WASHINGTON, D C, *23 March 1978*

Operator, Organizational, Direct Support
And General Support Maintenance Manual

COMPRESSOR, RECIPROCATING AIR,
15 CFM, 175 PSI, TANK MOUNTED, GED,
(CHAMPION PNEUMATIC MODEL HGR5-8M-1)
AND
(CHAMPION PNEUMATIC MODEL HGR5-8M-6)
NSN 4310-00-880-0186
COMPRESSOR, RECIPROCATING AIR,
15 CFM, 175 PSI, TRAILER MOUNTED, GED,
(CHAMPION PNEUMATIC MODEL BGR-5M-1)
NSN 4310-00-852-1745

TM 5-4310-277-14, 25 March 1976, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration identification number.

Remove Pages	*Insert Pages*
i, ii	i, ii
iii, iv	iii, iv
1-1, 1-2	1-1, 1-2
	1-6.1, 1-6.2
1-7, 1-8	1-7, 1-8
1-11, 1-12	1-11, 1-12
1-13, 1-14	1-13, 1-14
2-1, 2-2	2-1, 2-2
2-3, 2-4	2-3, 2-4, 2-4.1/(2-4.2 Blank)
3-3, 3-4	3-3, 3-4
3-7, 3-8	3-7, 3-8
4-3 thru 4-8	4-3 thru 4-8
4-31, 4-32	4-31, 4-32, 4-32.1/(4-32.2 Blank)
4-35, 4-36	4-35, 4-36, 4-36.1/(4-36.2 Blank)
4-37, 4-38	4-37, 4-38, 4-38.1/(4-38.2 Blank)
4-41, 4-42	4-41, 4-42
	4-44.1/(4-44.2 Blank)
4-45, 4-46	4-45, 4-46, 4-46.1/(4-46.2 Blank)
4-47, 4-48	4-47, 4-48
4-51 thru 4-53	4-51 thru 4-54
5-1, 5-2	5-1, 5-2
6-1, 6-2	6-1, 6-2
6-9, 6-10	6-9, 6-10, 6-10.1, 6-10.2
6-11, 6-12	6-11, 6-12
6-13, 6-14	6-13, 6-14, 6-14.1/(6-14.2 Blank)
A-1	A-1

File this change sheet in front of the publication for reference purposes.

TM 5-4310-277-14
C1

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Brigadier General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A, Operator maintenance requirements for Air Compressors, 15 CFM.

TECHNICAL MANUAL
No. 5-4310-277-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C. 25 March 1976

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

COMPRESSOR, RECIPROCATING AIR, 15 CFM, 175 PSI, TANK MOUNTED, GED, (CHAMPION PNEUMATIC MODEL HGR5-8M-1) AND (CHAMPION PNEUMATIC MODEL HGR5-8M-6) NSN 4310-00-880-0186 COMPRESSOR, RECIPROCATING AIR, 15 CFM, 175 PSI, TRAILER MOUNTED, GED, (CHAMPION PNEUMATIC MODEL BGR-5M-1) NSN 4310-00-852-1745

REPORTING ERROR AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedure, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, U. S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished to you.

			Paragraph	Page
		LIST OF ILLUSTRATIONS		
		LIST OF TABLES		
CHAPTER	1.	INTRODUCTION		
Section	I.	General	1-1	1-1
	II.	Description and data	1-6	1-2
CHAPTER	2.	OPERATING INSTRUCTIONS		
Section	I.	Operating Procedures	2-1	2-1
	II.	Operation Under Unusual Conditions	2-6	2-6
CHAPTER	3.	OPERATOR'S MAINTENANCE INSTRUCTIONS		
Section	I.	Lubrication Instructions	3-1	3-1
	II.	Preventive Maintenance Checks and Services (PMCS)	3-3	3-4
	III.	Troubleshooting	3-5	3-6
	IV.	Maintenance Procedures	3-7	3-6

*This manual supersedes TM 5-4310-277-15, 12 June 1968, including all changes.

			Paragraph	Page
CHAPTER	4	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS		
Section	I.	Service Upon Receipt Of Materiel	4-1	4-1
	II.	Movement To A New Work Site	4-3	4-7
	III.	Repair Parts, Special Tools and Equipment	4-5	4-9
	IV.	Preventive Maintenance Checks and Services (PMCS)	4-7	4-9
	V.	Troubleshooting	4-9	4-10
	VI.	Maintenance Of Fuel System	4-11	4-18
	VII.	Maintenance Of Throttle Control	4-13	4-28
	VIII.	Maintenance Of Exhaust System	4-15	4-22
	IX.	Maintenance Of Tool Box, Model BGR-5M-1	4-17	4-23
	X.	Maintenance Of Drive Pulley, Belt Guard and Belt Set	4-18	4-25
	XI.	Maintenance Of Compressor	4-21	4-29
	XII.	Maintenance Of Compressor Controls, Instruments and Related Parts	4-31	4-42
	XIII.	Maintenance Of Air Receiver	4-37	4-48
	XIV.	Maintenance Of Engine (Model BGR-5M-1)	4-38	4-50
	XV.	Maintence Of Engine (Model HGR5-8M-1 , and Model HGR5-8M-6)	4-40	4-52
CHAPTER	5.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS		
Section	I.	Repair Parts, Special Tools and Equipment	5-1	5-1
	II.	Troubleshooting	5-3	5-1
	III.	General Maintenance	5-5	5-2
CHAPTER	6.	REPAIR INSTRUCTIONS		6-1
APPENDIX	A.	REFERENCES		A-1
	B.	MAINTENANCE ALLOCATION CHART		B-1
INDEX				I-1

List of Illustrations

Figure	Title	Page
1-1.	Air Compressor Model BGR-5M-1, Left Rear, Three Quarter View With Shipping Dimensions (TS 023926)	1-3
1-2.	Air Compressor Model BGR-5M-1, Right Front, Three Quarter View (TS 023927)	1-4
1-3.	Air Compressor Model BGR-5M-1, Left Rear, Three Quarter View With Canvas Cover In Place (TS 023928)	1-5
1-4.	Air Compressor Model HGR5-8M-1, Right Rear, Three Quarter View With Shipping Dimensions (TS 023929)	1-6
1-4.1	Air Compressor Model HGR5-8M-6, Right Rear, Three Quarter View With Shipping Dimensions (TS 023985)	1-6.1
1-5.	Air Compressor Model HGR5-8M-1 (Serial Numbers 10160 through 10400), Left Front, Three Quarter View (TS 023930)	1-7
1-5.1	Air Compressor Model HGR5-8M-6, (Serial Numbers 17692 through 18099, Left Front, Three Quarter View (TS 023986)	1-7.1
1-6.	Air Compressor Model HGR5-8M-1 (Serial Numbers 13655 through 13745), Left Front, Three Quarter View (TS 023931)	1-8
1-7.	Identification Plate (Sheet 1 of 2) (TS 023932)	1-9
1-7.	Identification Plate (Sheet 2 of 2) (TS 023933)	1-10
1-8.	Compressor Data Plate (TS 023934)	1-11
1-9.	Mounting Base Plan, Model HGR5-8M-1 (TS 023935)	1-13
2-1.	Controls and Instruments, Model BGR-5M-1 (Sheet 1 of 2) (TS 023936)	2-2
2-1.	Controls and Instruments, Model BGR-5M-1 (Sheet 2 of 2) (TS 023937)	2-3
2-1.1	Controls and Instruments, Model HGR5-8M-6 (TS 023987)	2-3.1
2-2.	Starting The Air Compressor (TS 023938)	2-4
2-3.	Stopping The Air Compressor (TS 023939)	2-5
2-4.	Operating The Air Compressor (TS 023940)	2-6
3-1.	Lubrication Order (Sheet 1 of 2) (TS 023941)	3-2
3-1.	Lubrication Order (Sheet 2 of 2) (TS 023942)	3-3
3-2.	Preventive Maintenance Services, Model BGR-5M-1 and HGR5-8M-1 (TS 023943)	3-5
3-3.	Compressor Air Cleaner, Exploded View (TS 023944)	3-7
3-3.1	Compressor Air Cleaner, Exploded View, Model HGR5-8M-6 (TS 023988)	3-7.1
3-4.	Oil Filler and Drain Plugs, Removal and Installation (TS 023945)	3-9
4-1.	Shipping Tie-Downs, Model BGR-5M-1 (TS 023946)	4-2
4-2.	Shipping Tie-Downs, Model HGR5-8M-1 (TS 023947)	4-3
4-3.	Separately Packed Components (TS 023948)	4-4
4-4.	Mounting Pase Plan, Model HGR5-8M-1 (TS 023949)	4-6
4-5.	Globe Valve, Air Hose Assembly and Inflator Gage, Removal and Installation (TS 023950)	4-8
4-6.	Belt Guard, Removal and Installation (TS 023951)	4-12
4-7.	V-Belts, Drive Pulley, Flywheel and Engine, Removal and Installation (TS 023952)	4-14
4-8.	Intake and Exhaust Valves, Removal and Installation (TS 023953)	4-16
4-9.	Intake and Exhaust Valves, Disassembly and Reassembly (TS 023954)	4-17
4-10.	Fuel Tank, Filter and Related Parts, Exploded View (TS 023955)	4-19
4-11.	Manifolds, Valves, Tubes and Fittings, Exploded View (TS 023956)	4-21
4-12.	Engine Muffler, Removal and Installation (TS 023957)	4-23
4-13.	Tool Box and Air Receiver, Removal and Installation (TS 023958)	4-24
4-14.	Belt Guard, Removal and Installation (TS 023959)	4-26
4-15.	V-Belts, Drive Pulley, Flywheel and Engine, Removal and Installation (TS 023960)	4-28
4-16.	Compressor, Removal and Installation, Model BGR-5M-1 (TS 023961)	4-30
4-17.	Compressor, Removal and Installation, Model HGR5-8M-1 (TS 023962)	4-32
4-17.1	Compressor, Removal and Installation, Model HGR5-8M-6 (TS 023989)	4-32.1
4-18.	Head Unloader Manifold, Low Pressure Intake Exploded View (TS 023963)	4-34
4 19.	Head Unloader Manifold, High Pressure Intake - Exploded View (TS 023964)	4-35
4-20.	Pilot Valve, Exploded View (TS 023965)	4-36
4-20.1	Pilot Valve, Exploded View (TS 023990)	4-36.1
4-21.	Intake and Exhaust Valves, Exploded View (TS 023966)	4-38
4-22.	Centifugal Unloader, Exploded View (TS 023967)	4-40
4-23.	Handhole Plate, Removal and Installation (TS 023968)	4-42
4-24.	Compressor Controls and Instruments, Model BGR-5M-1, Exploded View (TS 023969)	4-43

List of Illustrations

Figure	Title	Page
4-25.	Compressor Controls and Instruments, Model HGR5-8M-1, Exploded View (TS 023970)	4-44
4-25.1	Compressor Controls and Instruments, Model HGR5-8M-6 (TS 023991)	4-44.1
4-26.	Check Valve, Exploded View (TS 023971)	4-45
4-27.	Check Valve, Exploded View (Model HGR5-8M-1, Serial Numbers 13655 through 13745) (TS 023972)	4-46
4-27.1	Check Valve, Exploded View, Model HGR5-8M-6 (TS 023992)	4-46.1
4-28.	Globe Valve, Exploded View (TS 023973)	4-47
4-29.	Air Receiver, Removal and Installation (TS 023974)	4-49
4-30.	V-Belts, Drive Pulley, Flywheel and Engine, Removal and Installation (TS 023975)	4-51
4-31.	Engine Removal and Installation, Model HGR5-8M-1 (TS 023976)	4-53
4-31.1	Engine Removal and Installation, Model HGR5-8M-6 (TS 023993)	4-53.1
6-1.	Oil Filler Plugs, Filler Caps, Removal and Installation (TS 023977)	6-2
6-2.	Belt Guard, Removal and Installation (TS 023978)	6-3
6-3.	V-Belts, Drive Pulley, Flywheel and Engine, Removal and Installation (TS 023979)	6-4
6-4.	Manifolds, Valves, Tubes and Fittings, Exploded View (TS 023980)	6-6
6-5.	Handhole Plate and Gasket, Exploded View (TS 023981)	6-8
6-6.	Cylinder Block, Pistons and Connecting Rods, Exploded View (TS 023982)	6-9
6-6.1	Cylinder Block, Pistons and Connecting Rods, Model HGR5-8M-6, Exploded View (TS 023994)	6-9.1
6-7.	Crankshaft, Crankcase and Related Parts, Exploded View (TS 023983)	6-12
6-7.1	Crankshaft, Crankcase and Connecting Rods, Model HGR5-8M-6, Exploded View (TS 023995)	6-12.1
6-8.	Base Assembly (Model BGR-5M-1) (TS 0239844)	6-14

List of Tables

Figure Number	Title	Page
3-1.	Operator/Crew Preventive Maintenance Checks and Services	3-4
3-2.	Troubleshooting	3-6
4-1.	Maintenance and Operating Supplies	4-5
4-2.	Organizational Preventive Maintenance Checks and Services	4-9
4-3.	Troubleshooting	4-11
5-1.	Troubleshooting	5-1
5-2.	Compressor Repair and Replacement Standards	5-2

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the reciprocating air compressor, Champion Pneumatic Machinery Company Models BGR-5M-1 and HGR5-8M-1.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are as follows:

a. DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

b. DA Form 2407 (Maintenance Request Used for Requesting Support Maintenance).

c. DA Form 2407-1 (Continuation Sheet Used for Requesting Support Maintenance).

d. For further information, refer to TM 38-750 (The Army Maintenance Management System (TAMMS).

1-3. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

1-4. Destruction of Army Materiel to Prevent Enemy Use

Refer to the below listed instructions on the destruction of the reciprocating air compressors to prevent enemy use and to TM 750-244-3.

a. General. When capture or abandonment of the air compressor to an enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all the air compressors' and all corresponding repair parts.

b. Demolition to Render the Equipment Inoperative. Use sledge hammers, crowbars, pick, axes, or other heavy tools to damage the engine, air cleaner, hose gage, cylinder block, air tubing, intercooler and aftercooler manifolds, drive belts, and valves.

c. Demolition by Explosives or Weapons Fire.

(1) *Explosives.* Place the following charges and detonate them simultaneously with a detonating cord and suitable detonator.

(a) Two 1/2-pound (0.225 kg) charges on compressor crankcase.

(b) One 1/2-pound charge between engine block and air intake pipe.

(c) One 1/2-pound charge on engine block assembly.

(d) One 1/2-pound charge beneath compressor and engine platform (Model BGR-5M-1).

(e) One 1/2-pound charge beneath air tank (Model BGR-5M-1).

(f) One 1/2-pound charge beneath receiver tank mounting platform (Model HGR5-8M-1 and HGR5-8M-6).

(2) *Weapon's fire.* Fire on the air compressor with the heaviest practicable weapons available.

d. Other Demolition Methods.

(1) *Scattering and concealment.* Remove all easily accessible parts such as air cleaners, air hose assembly, draincock, globe valve, and safety valves. Scatter them in foliage, bury them in dirt or sand, or throw them in a lake, stream, well, or other body of water.

(2) *Burning.* Pack rags, clothing or canvas around the air compressor. Pour gasoline, oil, or diesel fuel over this material and ignite.

(3) *Submersion.* Totally submerge the air compressor in a body of water to provide water damage and concealment. Salt water will do greater damage than fresh water.

1-5. Administrative Storage

a. Store equipment so as to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.

b. Take into account environmental conditions, such as, extreme cold or heat; high humidity; blowing sand, dust or loose debris; soft ground; mud; heavy snows; earthquakes; or combinations thereof and take adequate precautions.

c. Establish a fire plan and provide for adequate precautions.

d. For further information, refer to TM 740-90-1, Administrative Storage of Equipment.

Section II. DESCRIPTION AND DATA

1-6. Description

a. General. The Model BGR-5M-1 air compressor consists of a reciprocating type compressor, gasoline engine, fuel tank, and air receiver assembly which are all attached to a base. The base is mounted to a trailer (figs. 1-1, 1-2, and 1-3). Model HGR5-8M-1 and HGR5-8M-6 are similar, except that the compressor, engine, and fuel tank are attached to a platform welded to a free standing horizontal air receiver tank (figs. 1-4, 1-4.1, 1-5, 1-5.1, and 1-6).

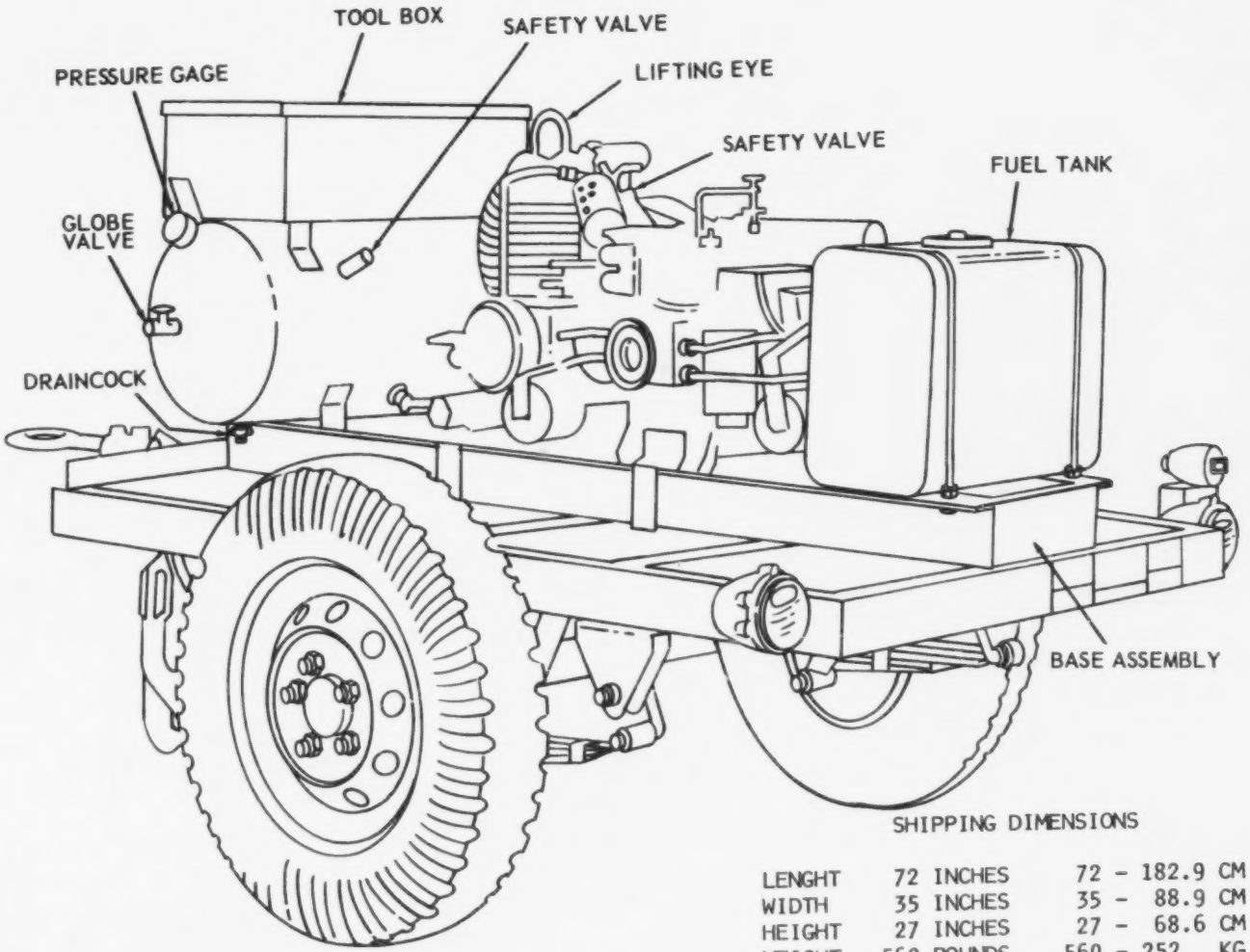


Figure 1-1. Air compressor model BGR-5M-1, left rear, three quarter view with shipping dimensions.

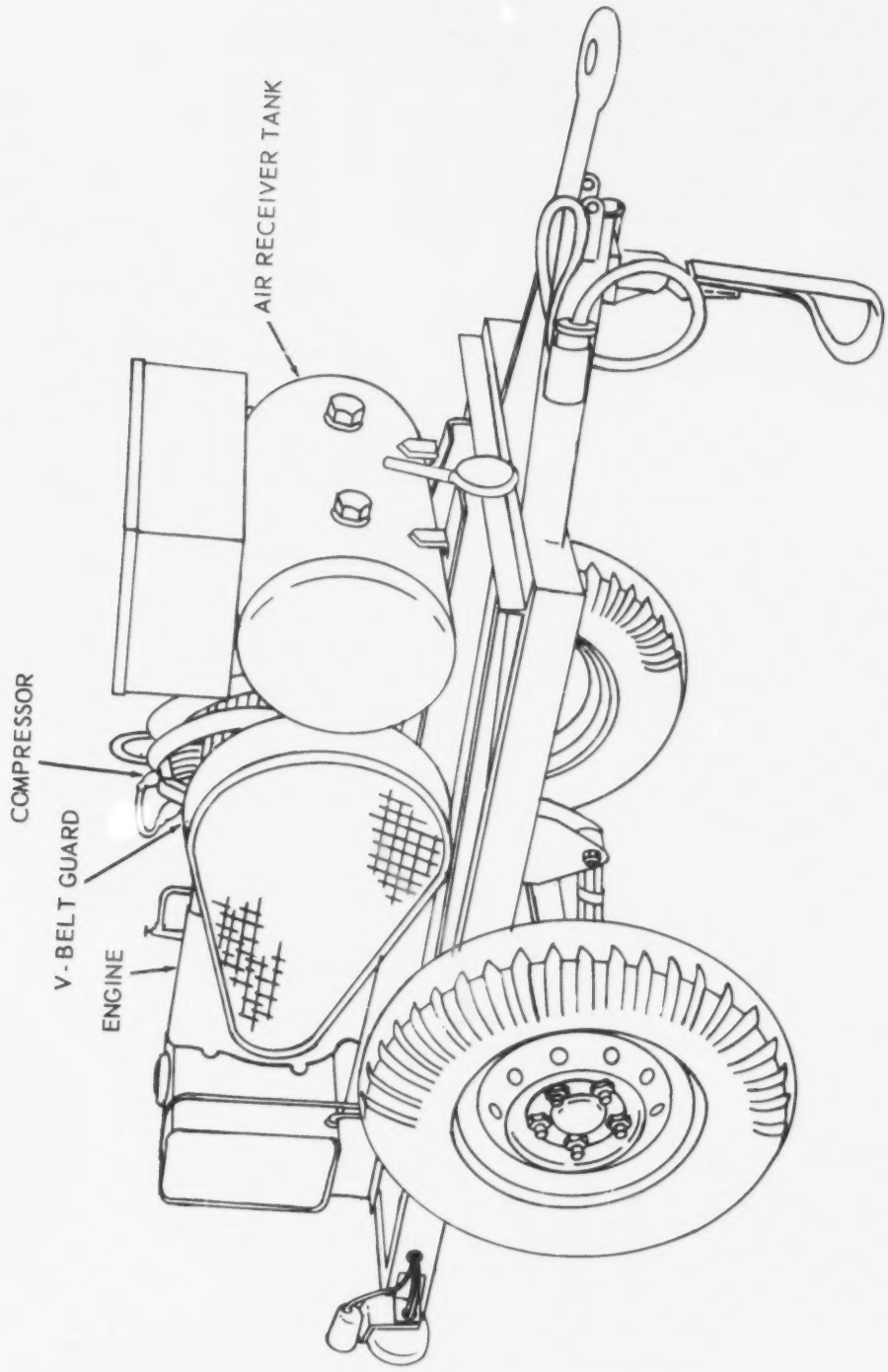


Figure 1-2. Air compressor model BGR-5M-1, right front, three quarter view.

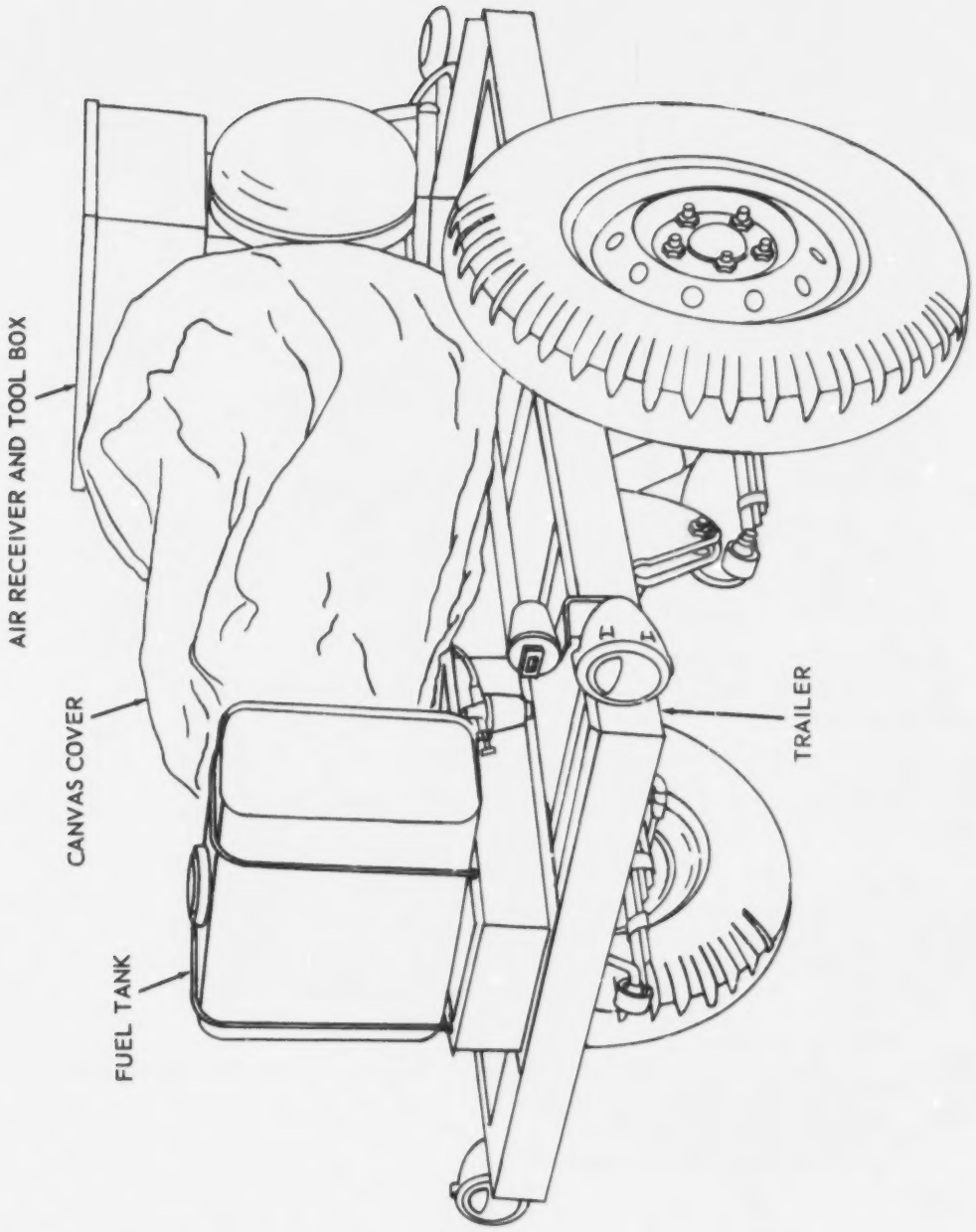


Figure 1-3 Air compressor model BGR-5M-1, left rear, three quarter view with canvas cover in place.

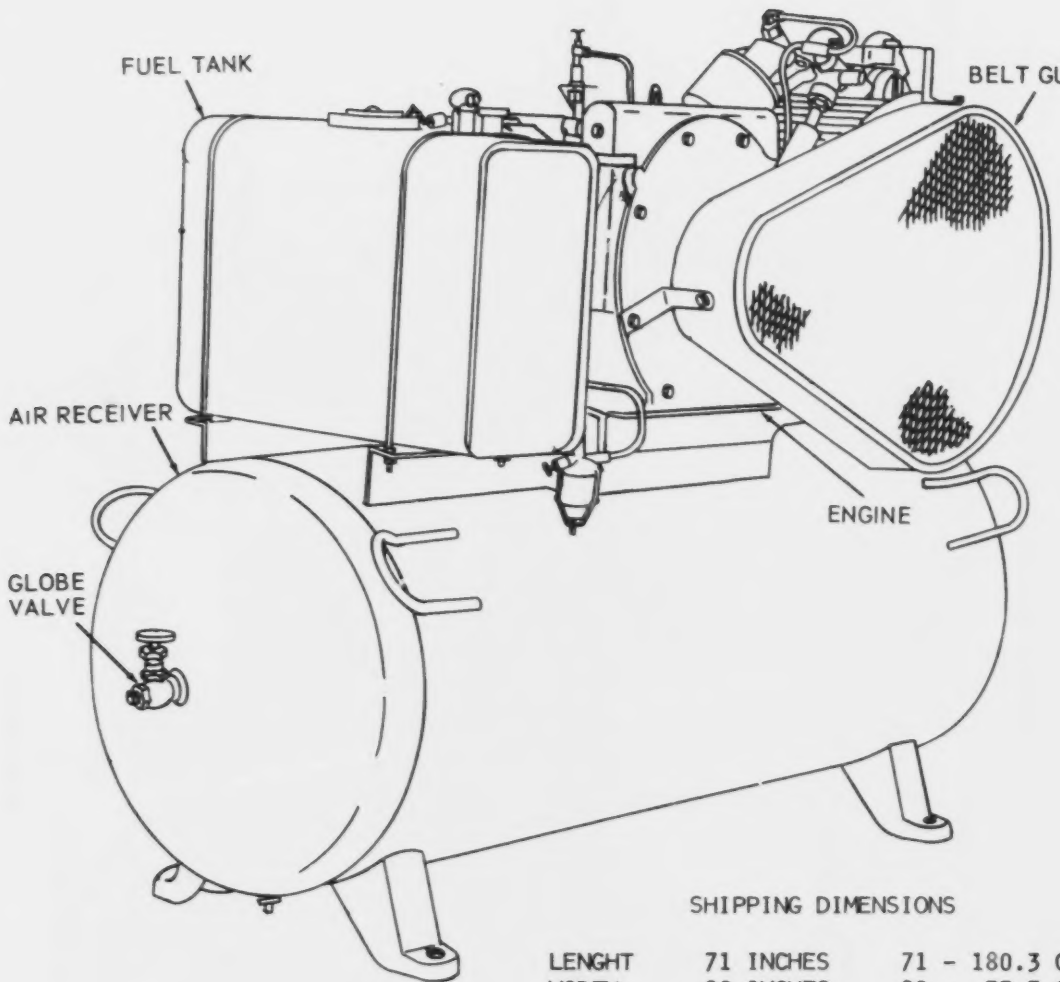


Figure 1-4. Air compressor model HGR5-8M-1, right rear, three quarter view with shipping dimensions.

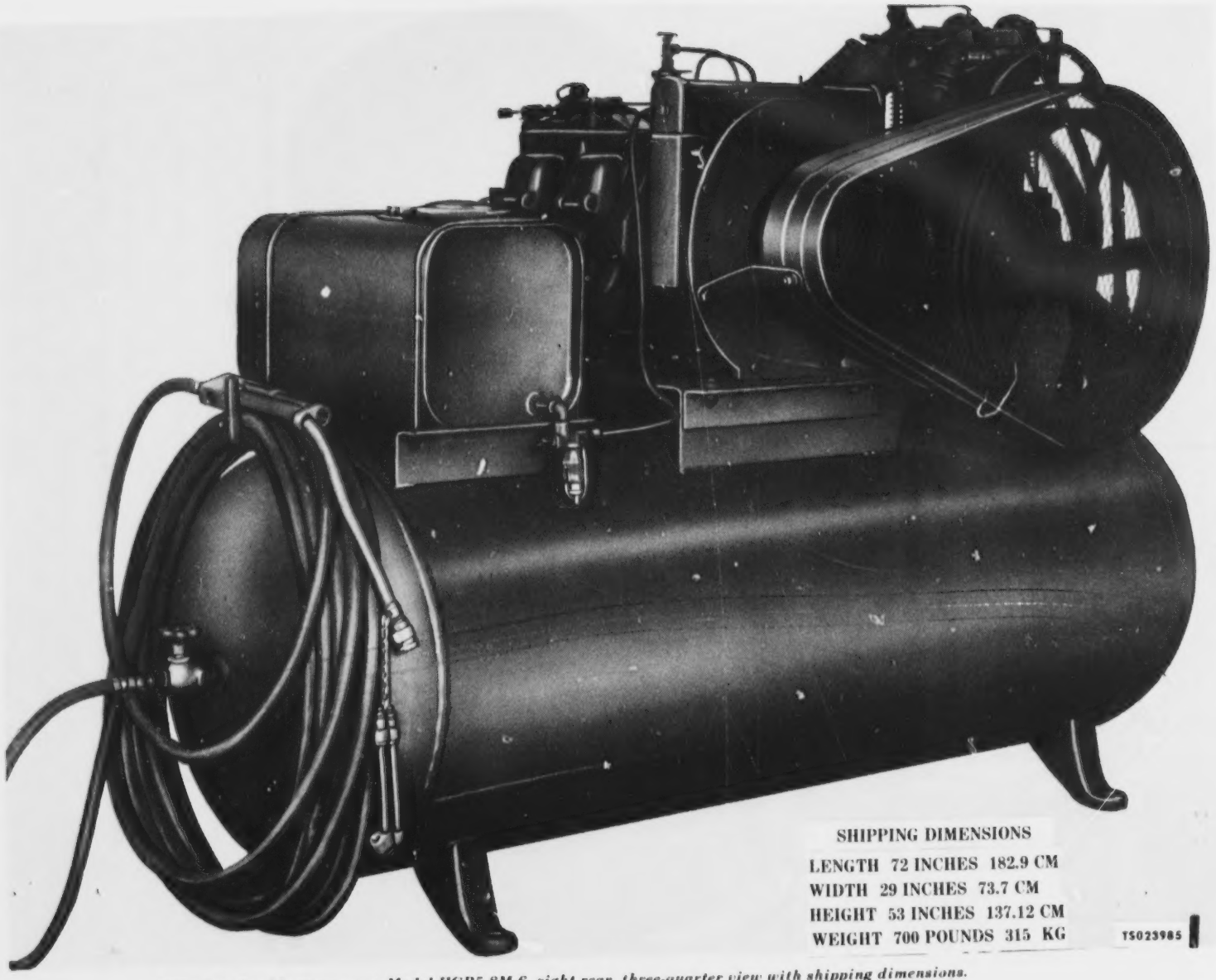


Figure 1-4.1. Air compressor Model HGR5-8M-6, right rear, three-quarter view with shipping dimensions.

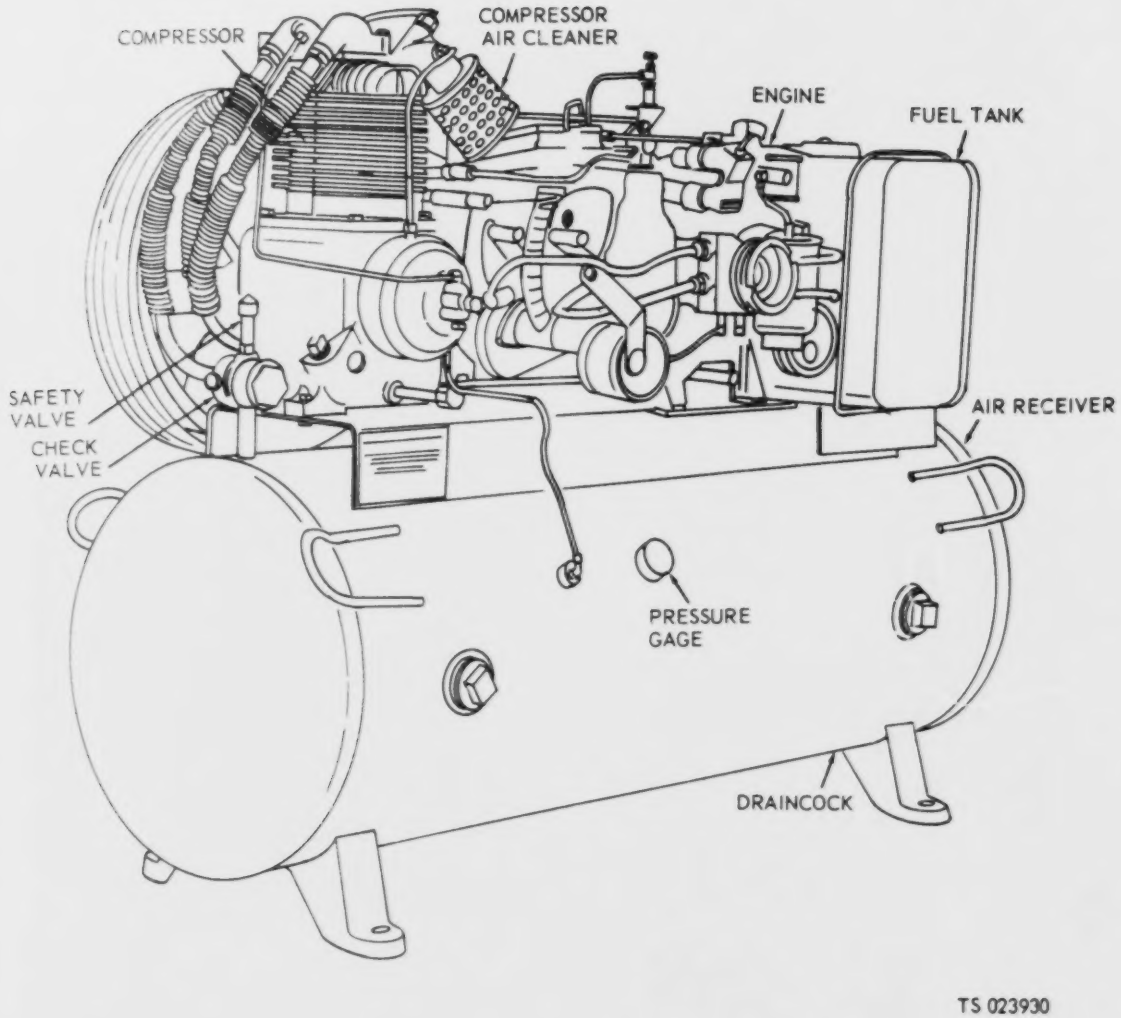


Figure 1-5. Air compressor model HGR5-8M-1 (serial numbers 10160 through 10400), left front, three quarter view.

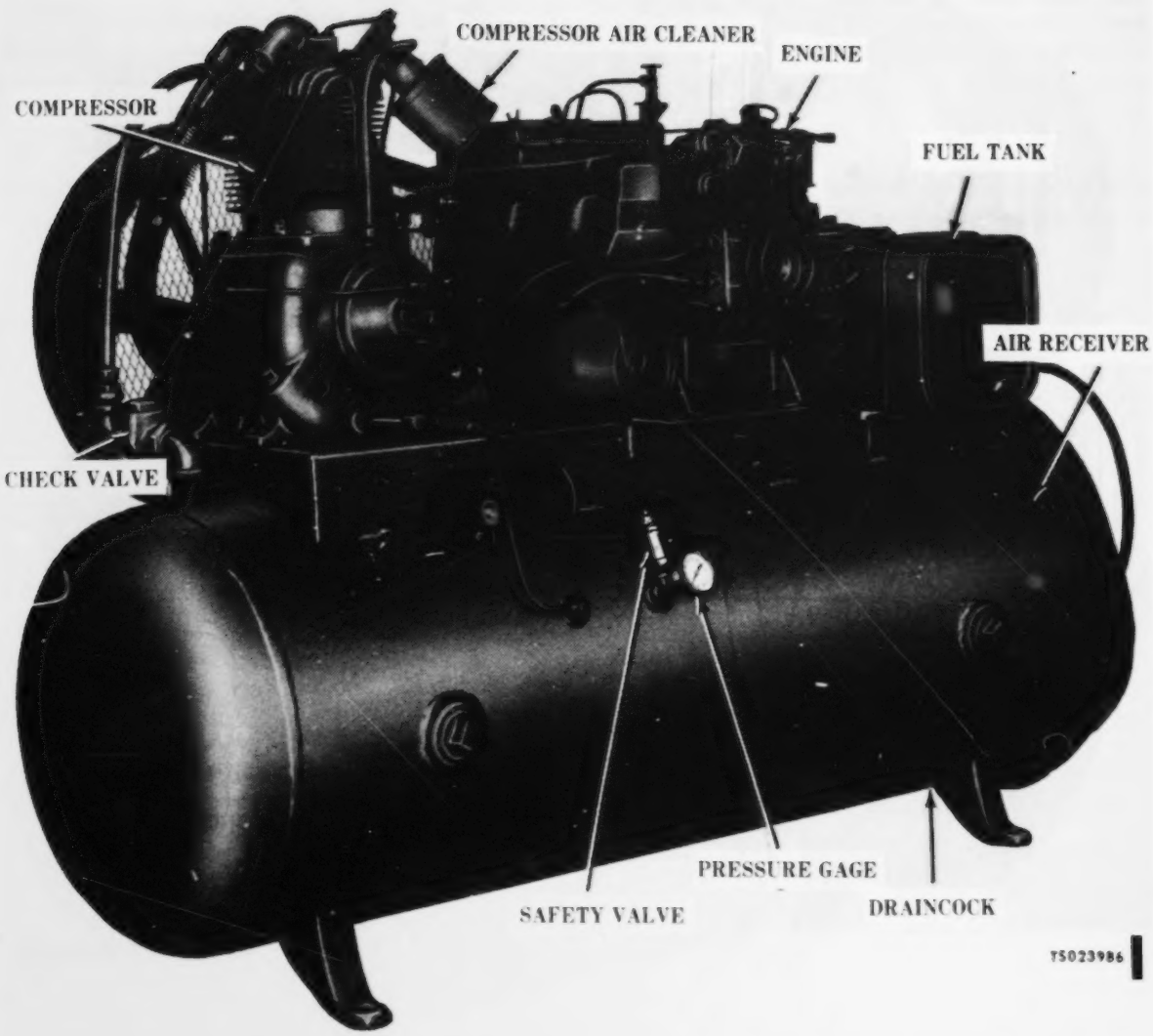


Figure 1-5.1. Air compressor Model HGR5-8M-6, left front, three-quarter view.

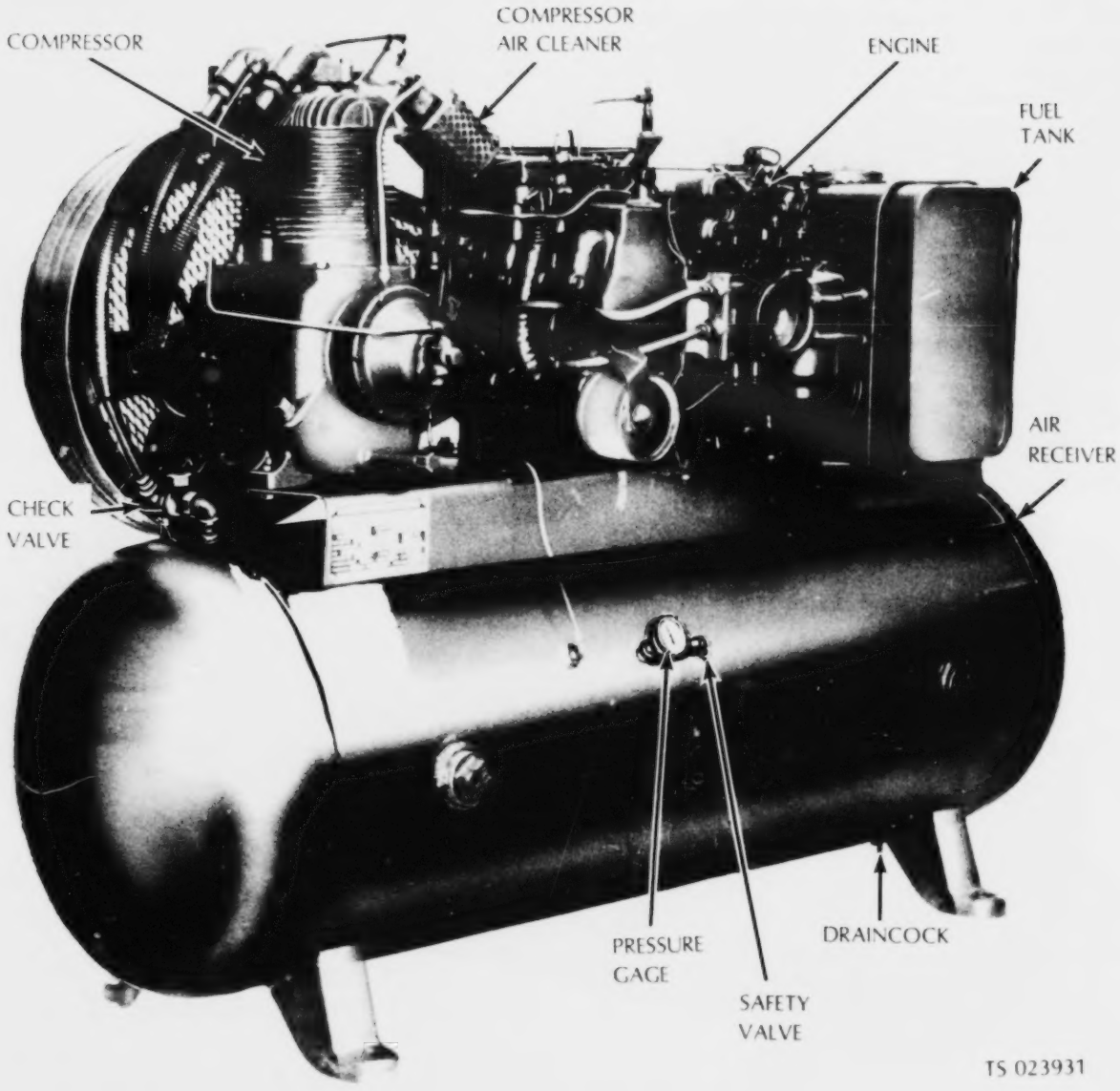


Figure 1-6. Air compressor model HGR5-8M-1 (serial numbers 13655 through 13745), left front three quarter view.

b. Compressor. The compressor is a two-cylinder, two-stage, vertical, air-cooled unit V-belt driven. It will deliver 15 cfm (cubic feet per minute) at 175 psi (pounds per square inch) (12.3025 kg per sq cm) (kilograms per square centimeter) when driven at 735 rpm (revolutions per minute). Constant speed unloading is provided. Constant speed operation allows the compressor to run continuously without stopping or starting the engine after each cycle. The compressor stops compressing air and runs free until the pressure in the air receiver has dropped to a predetermined setting at which time the compressor starts compressing air again until the pressure reaches its predetermined limit.

c. Engine. The engine is military standard Model 4A032-2, NSN 2805-00-068-7512.

d. Air Receiver Tank.

(1) The air receiver tank for air compressor Model BGR-5M-1 has a capacity of 2.7 cubic feet (20 gallons) and a maximum working pressure of 200 psi (14.1 kg per sq cm). A tool box assembly is attached to the top of the air receiver.

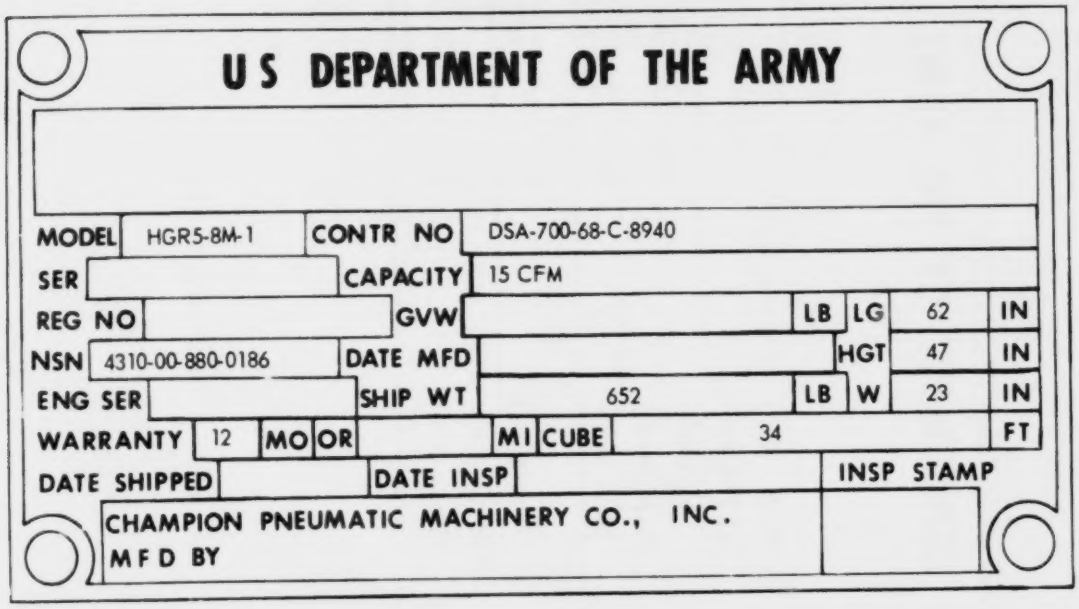
(2) The air receiver for Model HGR5-8M-1 is a horizontal type tank supported on four steel feet. It has a capacity of 10.6 cubic feet (80 gallons) and a maximum working pressure of 200 psi (14.1 kg per sq cm). Platforms are welded to the top of the tank for attachment of the engine, compressor, and fuel tank.

e. Trailer (Applicable to Model BGR-5M-1 Only). The trailer is military standard Model M-569, 1/4 ton, NSN 2330-00-884-4817.

1-7. Tabulated Data

a. Identification. The air compressor has two major identification plates. The information contained on these plates is listed below:

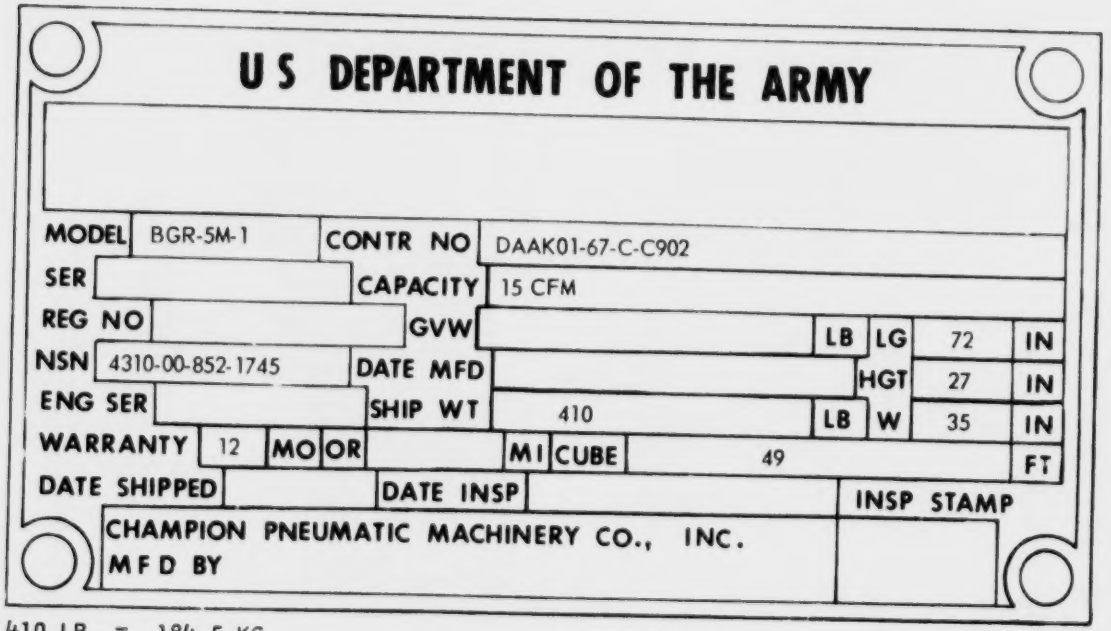
(1) *Identification plate.* The identification plate specifies the name of the manufacturer, make, model number, date of manufacture, serial number, and National stock number of the complete unit. The plates are mounted on the air compressor base (Model HGR5-8M-1), and on the mounting base (Model BGR-5M-1) and are illustrated as Figure 1-7.



652 LB = 293.4 KG
62 IN = 157.5 CM
47 IN = 119.4 CM
23 IN = 58.4 CM
34 FT = 1020 CM

TS 023932

Figure 1-7. Identification plate (sheet 1 of 2).

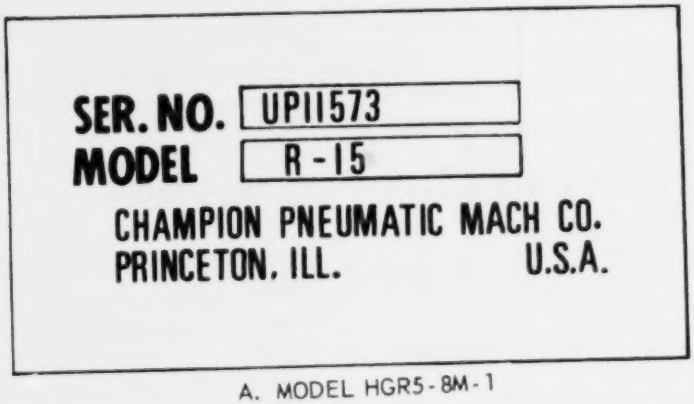


410 LB = 184.5 KG
72 IN = 182.9 CM
27 IN = 68.6 CM
35 IN = 88.9 CM
49 FT = 1470 CM

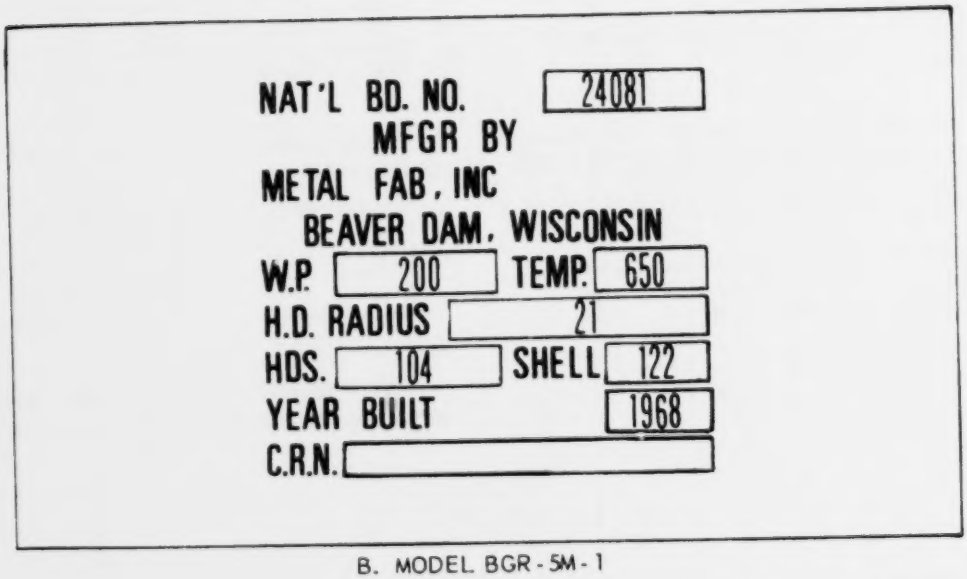
TS 023933

Figure 1-7. Identification plate (sheet 2 of 2).

(2) *Air compressor plate.* The compressor identification plate specifies the name of the manufacturer, model number, and serial number of the compressor. The plates are mounted on the side of the compressor crankcase (Model HGR5-8M-1) and on the air receiver tank (Model BGR-5M-1) and are illustrated as Figure 1-8.



A. MODEL HGR5-8M-1



B. MODEL BGR-5M-1

TS 023934

Figure 1-8. Compressor data plate.

b. Tabulated Data.

(1) Air compressor (trailer mounted).

Manufacturer	Champion Pneumatic Machinery Company, Inc.
Model number	BGR-5M-1
Output	15 cfm, 175 psi (12.3025 kg per sq cm)
Serial number	10160 through 10400

(2) Air compressor (air receiver mounted).

Manufacturer	Champion Pneumatic Machinery Company, Inc.
Model number	HGR5-8M-1, and HGR5-8M-6
Output	15 cfm, 175 psi (12.3025 kg per sq cm)
Serial number	8921 through 10159
Serial number	13655 through 13745
Serial number	17692 through 18099 (HGR5-8M-6)

(3) Compressor (for models BGR-5M-1, HGR5-8M-1 and HGR5-8M-6).

Manufacturer	Champion Pneumatic Machinery Company, Inc.
Model	R-15HU
Type	Reciprocating, 2 cylinder, 2 stage, vertical
Speed	735 rpm (revolutions per minute
Bore and stroke:	
Low pressure stage	4 5/8 x 3 inches (11.7 x 7.6 cm)
High pressure stage	2 1/2 x 3 inches (6.3 x 7.6 cm)
Air cleaner type	dry

(4) Engine. Complete operator and maintenance data on the engine is covered in TM 5-2805-203-14.

(5) Air receiver, model BGR-5M-1.

Manufacturer	Metal Fab, Inc.
Capacity	2.7 cubic feet (20 gallons)
Head thickness	0.104 inches (.26 cm)
Maximum temperature	650°F. (343°C.)

(6) Air receiver, model HGR5-8M-1.

Manufacturer	Engineering Controls, Inc.
Capacity	10.6 cubic feet (80 gallons)
Working pressure	200 psi (pounds per square inch) (14.1 kg per sq cm)
Head thickness	0.122 inches (.31 cm)
Maximum temperature	650°F. (343°C.)

(7) Capacities.

Compressor crankcase	2 quarts (1.9 liters)
Fuel tank	9.1 gallons (34.6 liters)
Fuel tank	4.9 gallons (18.6 liters) (HGR5-8M-6)
Engine oil filter	1 pint (.47 liters)

(8) Dimensions and weights, model BGR-5M-1.

Shipping cube	59.4 cubic feet (1682 cubic cm)
Length	72 inches (183 cm)
Height	27 inches (68 cm)
Width	35 inches (89 cm)
Weight	410 pounds (184 kg)
Weight (shipping)	560 pounds (252 kg)

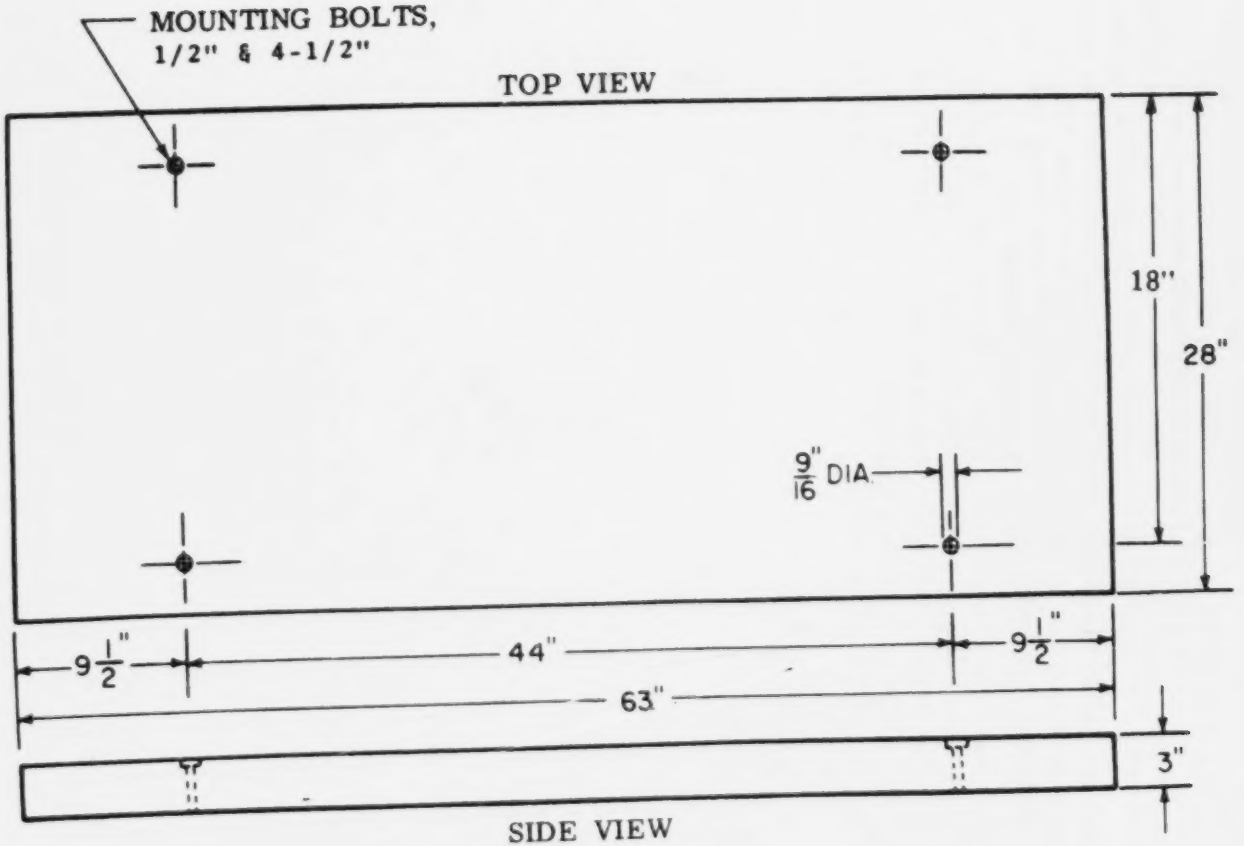
(9) Dimensions and weights, model HGR5-8M-1.

Shipping cube	61 cubic feet (1727 cubic cm)
Length	71 inches (180 cm)
Height	51 inches (129 cm)
Width	29 inches (74 cm)
Weight	652 pounds (293 kg)
Weight (shipping)	700 pounds (315 kg)

(10) Dimensions and weights, model HGR5-8M-6.

Shipping cube	61 cubic feet (1727 cubic cm)
Length	72 inches (183 cm)
Height	52 inches (132 cm)
Width	29 inches (74 cm)
Weight	652 pounds (293 kg)
Weight (shipping)	700 pounds (315 kg)

(11) Mounting dimensions, model HGR5-8M-1 and HGR5-8M-6. (See base plan) (fig. 1-9).



1/2	=	1.3 CM	9/16	=	1.4 CM
4 1/2	=	11.5 CM	9 1/2	=	24.2 CM
9 1/2	=	24.2 CM	3	=	7.6 CM
44	=	111.8 CM	18	=	45.7 CM
63	=	160 CM	28	=	71.1 CM

TS 023935

Figure 1-9. Mounting base plan, model HGR5-8M-1, and model HGR5-8M-6.

(11) *Trailer, model BGR-5M-1.* Complete operator and maintenance data on the trailer is contained in TM 9-2330-251-15.

(12) *Nut and bolt torque data.*

Cap screws	45 ft-lbs. (6.22 kgm), max.
Cylinder flange capscrews	45 ft-lbs. max.
Governor (centrifugal unloader) housing to crankcase capscrews	25 ft-lbs. (3.46 kgm), max.
Handhole plate to crankcase capscrews (model HGR5-8M-1 only)	25 ft-lbs. max. 25 ft-lbs. max.

1-8. Difference in Models and Serial Numbers

This manual covers Models BGR-5M-1 and HGR5-8M-1 air compressor assemblies. The differences between models is the air receiver and mounting of major components. On Model BGR-5M-1 the compressor, gasoline engine, fuel tank, and air receiver is attached to a base which provides a means for mounting the unit to a trailer. On Model HGR5-8M-1 and Model HGR5-8M-6, the compressor, engine, and fuel tank mount to platforms welded to a horizontal air receiver. Where differences exist, each model is covered separately in the applicable sections of this manual. On Model HGR5-8M-1 (serial numbers 13655 through 13745) a safety valve has been added next to the air receiver pressure gage. Handles have been removed from the air receiver tank, and compression fittings have replaced flared fittings on plumbing lines.

CHAPTER 2

OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

Section I. OPERATING PROCEDURES

2-1. General

This section describes, locates, illustrates, and furnishes the operator, crew, or organizational maintenance personnel sufficient information about the various controls and instruments for proper operation of the air compressor. For engine controls and instruments refer to TM 5-2805-203-14.

2-2. Controls and Instruments

The purpose of the controls and instruments and the normal and maximum reading of the instruments are illustrated in Figures 2-1 (sheet 1 of 2) and 2-1 (sheet 2 of 2), and 2-1.1, depending on model of compressor used.

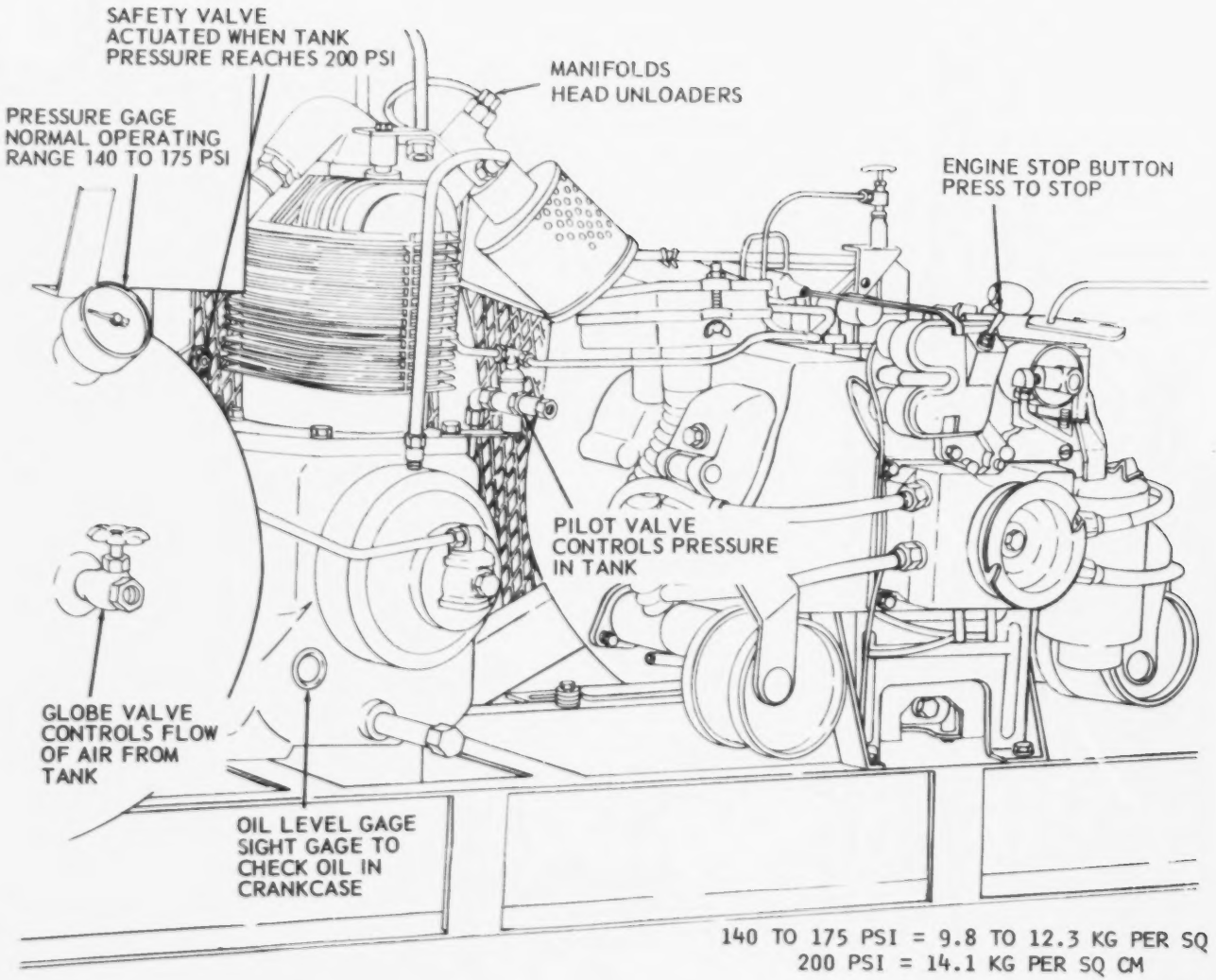


Figure 2-1. Controls and instruments, model BGR-5M-1 (sheet 1 of 2).

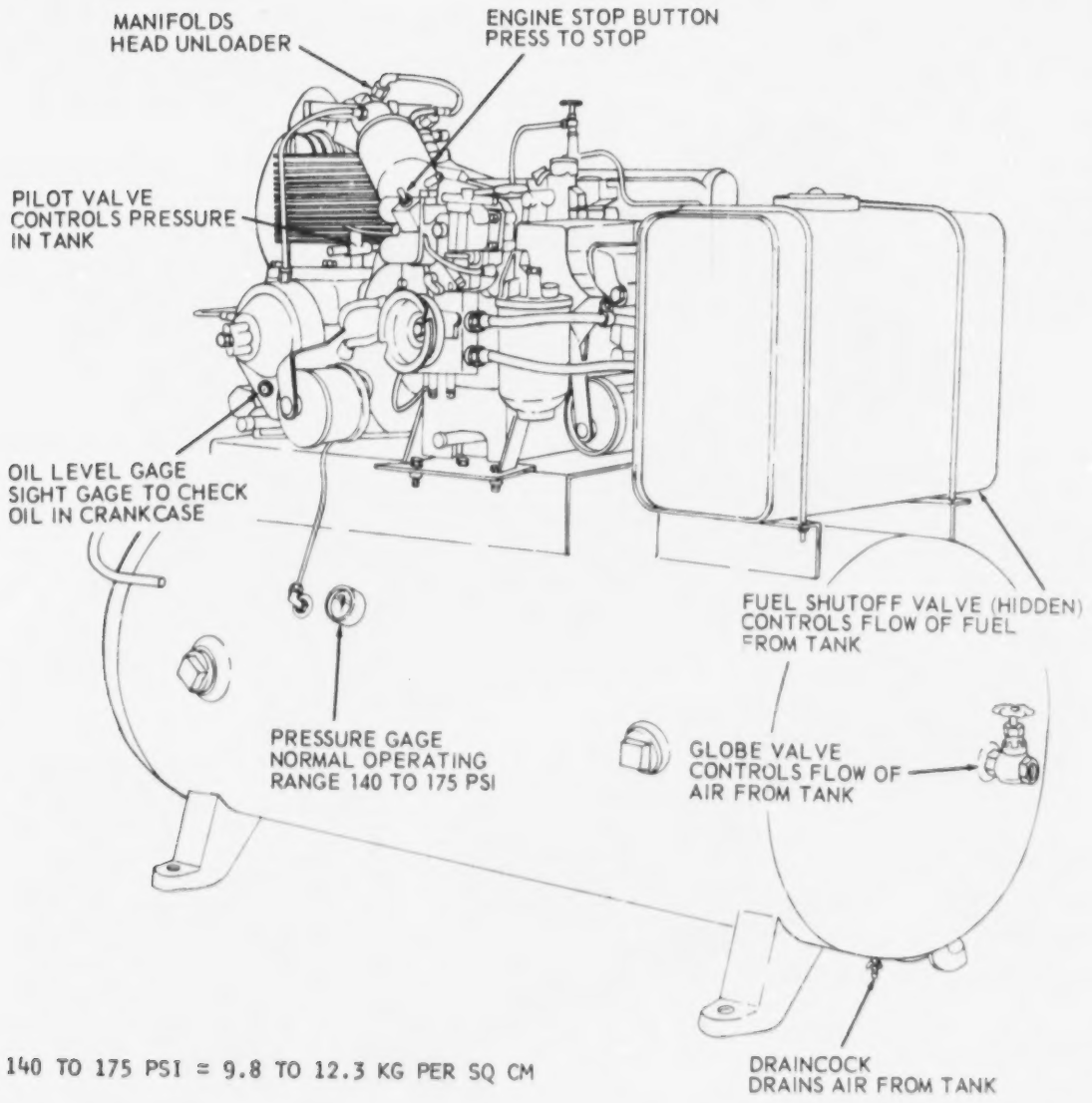


Figure 2-1. Controls and instruments, model BGR-5M-1 (sheet 2 of 2).

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. Wear ear muffs or ear plugs which were fitted by a trained professional.

WARNING

This compressor is NOT SUITABLE for the supply of air for charging cylinders with BREATHABLE AIR.

NOTE

The operator must know how to perform every operation of which the air compressor is capable. This section given instructions on starting and stopping the air compressor, basic motions to perform the specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

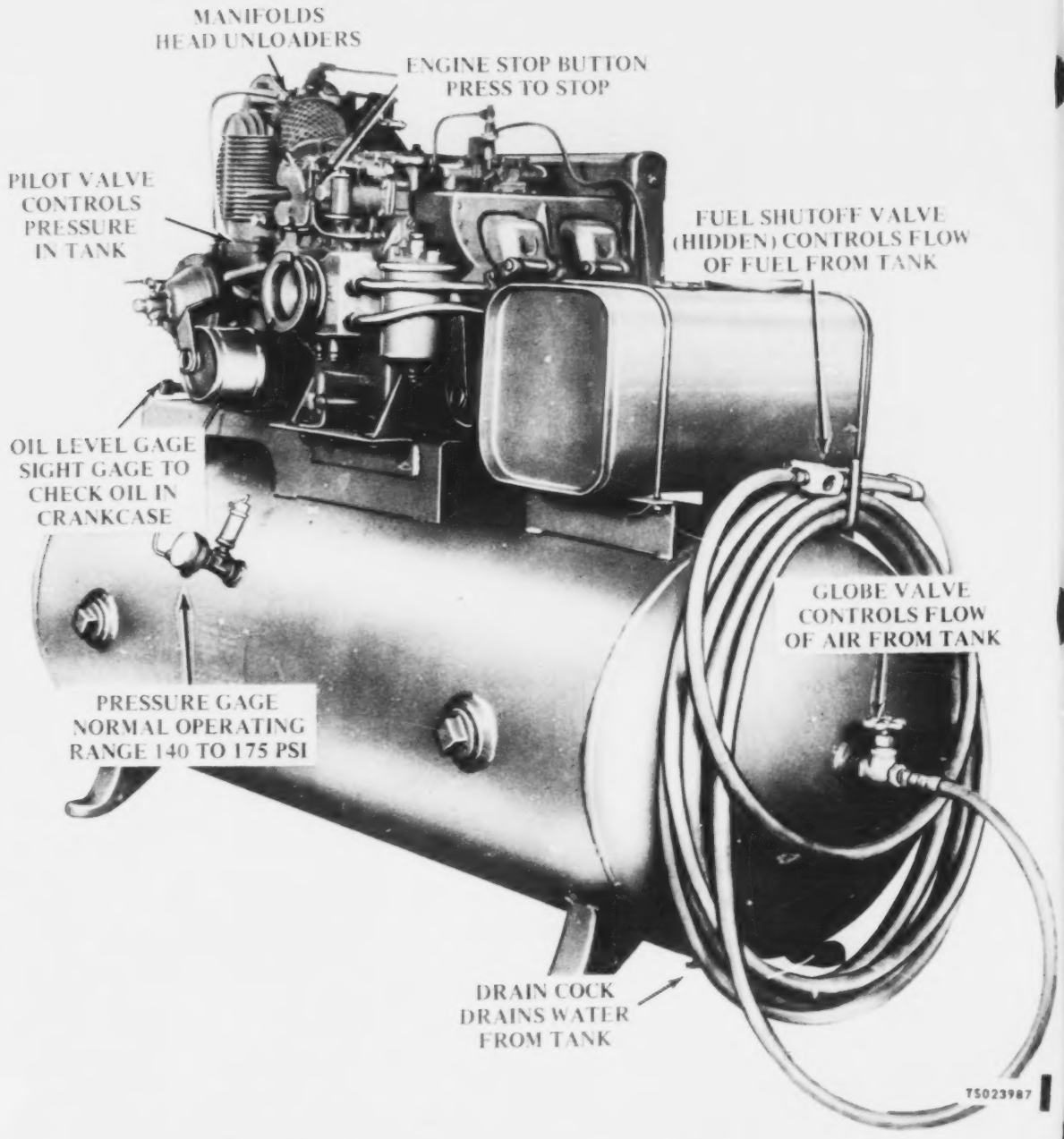


Figure 2-1.1. Controls and instruments, (model HGR5-8M-6)

2-3. Starting

a. Preparation for Starting. Perform the necessary daily preventive maintenance services, paragraph 3-4.

b. Starting. Refer to the following instructions and start the air compressor.

(1) Open draincock (fig. 2-2).

(2) Close choke lever.

(3) Turn start switch to "run".

(4) Wind starter rope clockwise around starter pulley.

(5) With a quick, steady pull, start the engine.

(6) When engine starts, gradually open choke lever.

(7) Close draincock.

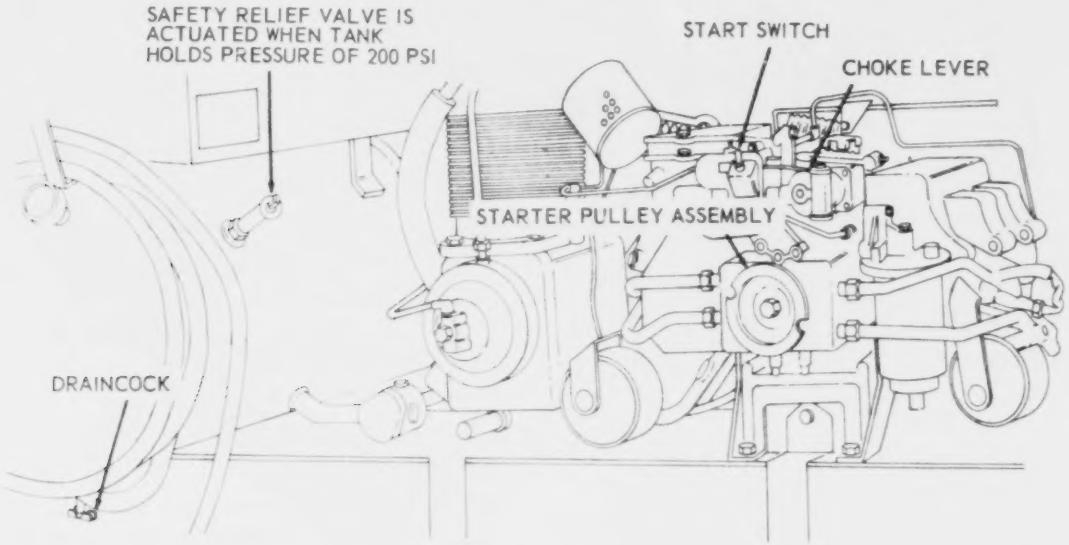

SAFETY RELIEF VALVE IS ACTUATED WHEN TANK HOLDS PRESSURE OF 200 PSI
START SWITCH
CHOKE LEVER
STARTER PULLEY ASSEMBLY
DRAINCOCK
200 PSI = 14.1 KG PER SQ CM
TS 023938

Figure 2-2. Starting the air compressor.

2-4. Stopping

a. Refer to the following instructions and stop the air compressor.

(1) Press stop button (fig. 2-3) until engine stops.

(2) Open draincock to blow air and condensate from tank.

(3) Close draincock.

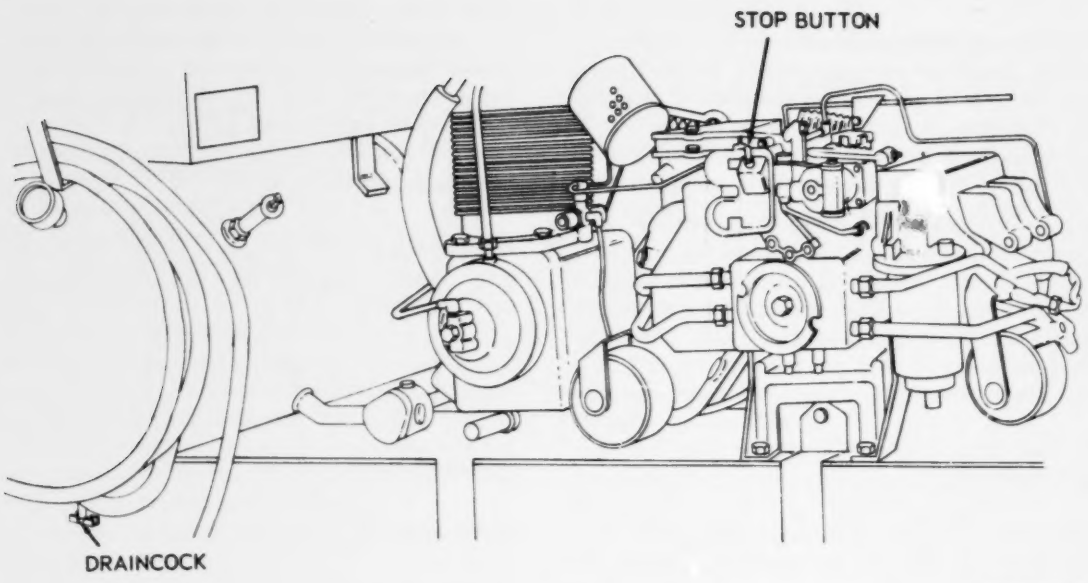


Figure 2-3. Stopping the air compressor.

b. Perform the necessary daily preventive maintenance services, paragraph 3-4.

2-5. Operation Under Usual Conditions

a. Start the air compressor.

b. Refer to the following instructions and operate the compressor.

(1) Check pressure gage reading - 140 to 175 psi (9.8 to 12.3 kg per sq cm) (fig. 2-4).

(2) Air compressor will continue to cycle as long as fuel is fed to the engine.

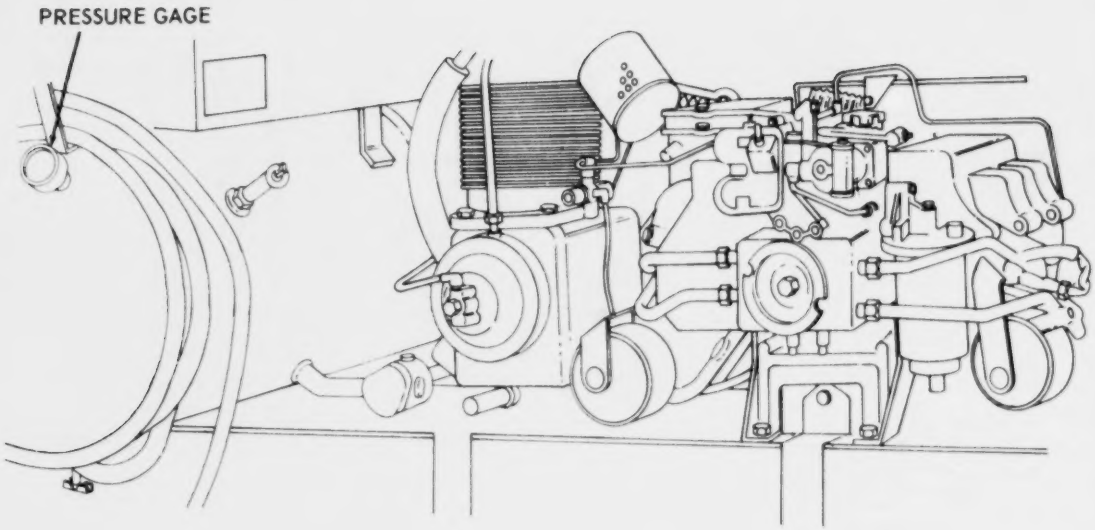


Figure 2-4. Operating the air compressor.

c. Stop the air compressor.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-6. Operation in Extreme Cold (Below 0° F.) (—18° C.)

a. Locate the air compressor in a shed or building whenever possible. If the unit is operated outdoors, protect it from prevailing winds and cover it with a tarpaulin when not in use.

b. Lubricate the air compressor according to the lubrication order.

c. Avoid excessive handling, kinking, and sharp bending of the air hose, which will become brittle at low temperatures.

d. Keep all fuel tanks and storage containers filled with fuel to prevent formation of ice crystals from the freezing of condensation. Such crystals will clog fuel lines and carburetor jets. Use filter paper, chamois, or other type strainer when filling the tank or pouring fuel from one container to another.

WARNING

Always provide a metallic contact between the fuel container and the fuel tank. This will prevent a spark from being generated as the gasoline flows over metallic surfaces.

2-7. Operation in Extreme Heat

a. Lubricate the air compressor in accordance with the lubrication order.

b. Check the drive belt (V-belt) tension frequently. Improper tension or misalignment often results in overheating.

c. Locate the air compressor in an operating area that is well ventilated or provide intake and exhaust fans to ventilate enclosed areas.

2-8. Operation in Dusty or Sandy Areas

a. Lubricate the air compressor in accordance with the lubrication order, making sure that all lubrication points are free from dirt and sand before applying lubricant. Keep all lubricant containers clean and tightly closed. Do not lubricate excessively as dirt and sand will adhere to excess lubricant and may work into moving parts. Wipe off all lubrication points after lubricating.

b. Protect the air compressor from dust with screens or shelter built from tarpaulins or other

dustproof material. Keep the unit covered when not in use.

c. Clean the compressor air cleaner more often than when operating under normal conditions.

d. Take adequate precautions to prevent foreign matter from entering the fuel tank. Service the fuel strainer screen in the filler neck of the fuel tank as often as necessary and keep the bowl of the fuel filter assembly free of foreign matter. Clean the engine air cleaner more often than usual.

2-9. Operation Under Rainy or Humid Conditions

a. Protect the unit with suitable shelter with adequate ventilation. Keep the sides open for ventilation when operating the unit.

b. Make sure all surfaces requiring lubrication are clean and dry before applying lubricant. Lubricate the unit in accordance with the lubrication order.

c. Coat exposed polished or machined metal surfaces with a suitable rustproof material after first removing any accumulation of rust.

d. Open the draincock frequently to blow water from the air receiver tank.

e. Service the engine air cleaner more frequently.

2-10. Operation in Salt Water Areas

a. Wipe the unit dry at frequent intervals.

b. If the unit becomes encrusted with salt, wash it with fresh water using a soft bristle brush if required to remove residue.

c. Make sure all surfaces requiring lubrication are clean and dry before applying lubricant. Lubricate the unit in accordance with the lubrication order.

d. Coat exposed polished or machined metal surfaces with a suitable rustproof material after first removing any accumulation of rust.

2-11. Operation at High Altitudes

a. The air compressor is designed to operate efficiently at elevations up to 5,000 feet. There will be a reduction in efficiency because of the rarefied air at this level. This is a normal unpreventable condition.

b. Do not operate the unit in small confined or enclosed areas that does not have ample air circulation or ventilation.

c. Fill the fuel tank at the end of each day's operation to prevent condensation of moisture in the fuel tank.

d. Adjust the engine carburetor to compensate for the reduced amount of oxygen available to the carburetor.

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General Lubrication Information

a. This section contains lubrication instructions which are supplemental to, and not specifically covered in the lubrication order.

b. For the current lubrication order refer to Figure 3-1.

LUBRICATION ORDER

LO5-4310-277-12

(Supersedes LO5-4310-277-12, dtd 14 June 1968)

COMPRESSOR, RECIPROCATING, AIR, 15 CFM, 175 PSI, TANK MOUNTED, GED, (CHAMPION PNEUMATIC MODEL HGR5-8M-1). COMPRESSOR RECIPROCATING, AIR, 15 CFM, 175PSI, TRAILER MOUMTED, GED. (CHAMPION PNEUMATIC MODEL BGR-5M-1)

Reference: C9100-IL, LO 5-2805-203-14

Intervals are based on normal hours of operation. Adjust to compensate for abnormal operation and severe conditions. During inactive periods, sufficient lubrication must be performed for adequate preservation.

Relubricate after washing.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

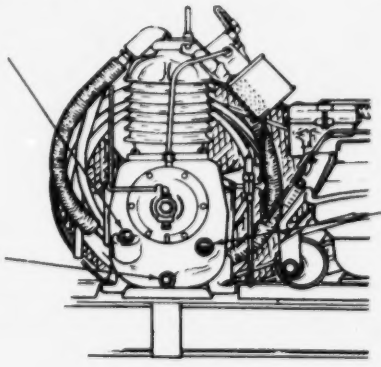
Drain crankcase when hot. Fill and check level.

FOLD FOLD

LUBRICANT ● INTERVAL

Compressor Crankcase Fill Plug (See Key.) OE

Compressor Drain Cap (Drain and Refill.) 500



INTERVAL ● LUBRICANT

10 Compressor Oil Level Sight Gage (Check level.)

TS 023941

Figure 3-1. Lubrication order (sheet 1 of 2).

-KEY-

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32° F	+40° F to -10° F	0° F to -65° F	
OE-OIL, Engine, Heavy Duty					
Compressor Crankcases	2 1/4 qt	OE 30	OE 10	OES	Intervals given are in hours of normal operation
OES-OIL, Engine, Sub-zero					

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW--10° F. Remove lubricants prescribed in the key for temperatures above--10° F. Relubricate with lubricants specified in the key for temperatures below--10° F.

2. LUBRICANTS. The following is a list of lubricants with the Military Symbols and applicable specification numbers.

OE MIL-L-2104
OES MIL-L-10295

Copy of this Lubrication Order will remain with the equipment at all times. Instructions contained herein are mandatory.

BY ORDER OF THE SECRETARY OF THE ARMY:

W. C. WESTMORELAND
General, United States Army,
Chief of Staff

OFFICIAL:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General

FOLD FOLD

TS 023942

Figure 3-1. Lubrication order (sheet 2 of 2).

3-2. Detailed Lubrication Information

a. General. Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Do not allow dust, dirt, or other foreign material to mix with the lubricants. Keep all lubrication equipment clean and ready to use.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) —138° F. (59° C.).

b. Cleaning. Keep all external parts not requiring lubrication clean of lubricants, using cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

c. Points of Lubrication. Service the lubrication points at proper intervals as illustrated in Figure 3-1.

d. OES Oil.

(1) Crankcase oil level must be checked frequently, as oil consumption may increase.

(2) Oil may require changing more frequently than usual because contamination by dilution and sludge formation will increase under cold weather operation conditions.

e. Engine Lubrication. Refer to LO 5-2805-203-14 for detailed engine lubrication.

f. Trailer Lubrication (Model BGR-5M-1 Only). Refer to LO 9-2330-251-15 for detailed trailer lubrication.

g. Compressor Air Cleaner. Disassemble the air cleaner, figures 3-3 or 3-3.1, depending on model used.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-3. General

To insure that the air compressor is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 3-4. Defects discovered during operation of the unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noticed during operation which would damage the equipment if operation were continued.

3-4. Preventive Maintenance Checks and Services

Refer to Table 3-1 and Figure 3-2 for the preventive maintenance checks and services.

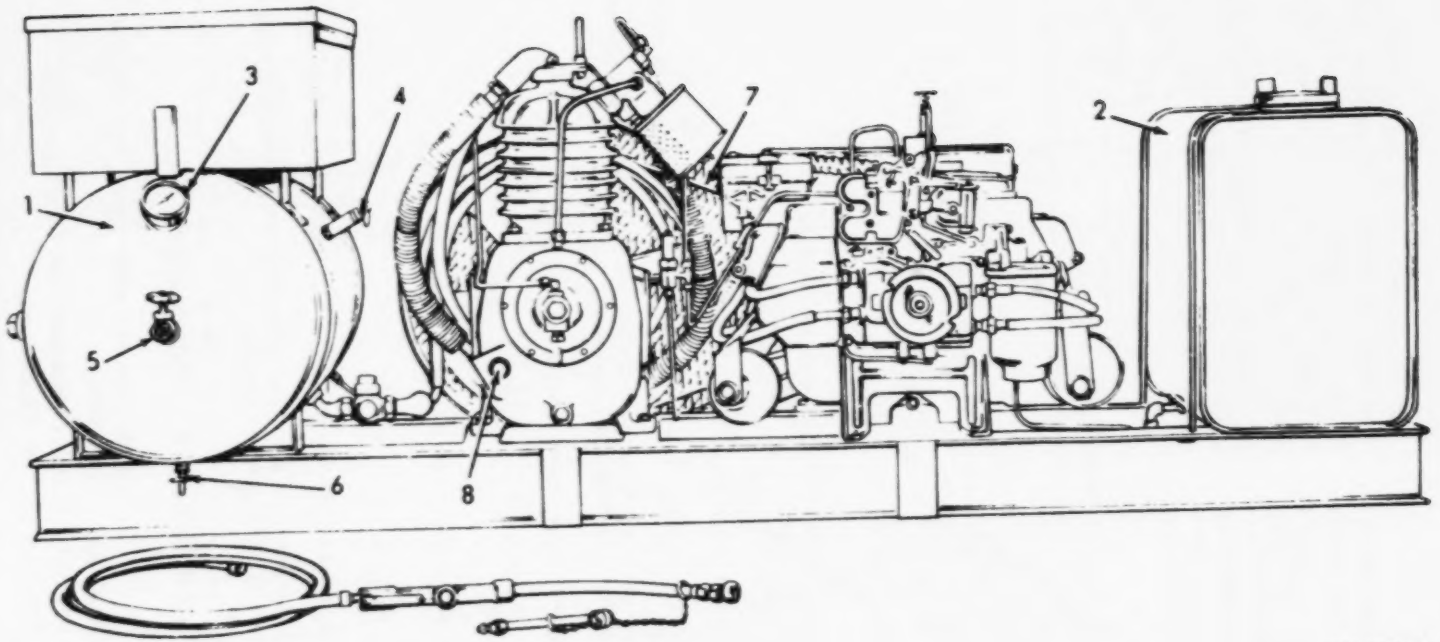
NOTE

Visually inspect for evidence of lubricant and fuel leaks concurrently with daily service checks.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

B—Before Operation Time Required: 0.8 | D—During Operation | A—After Operation Time Required: 0.8

Interval and Sequence No			Item to be inspected Procedure	Work time (M H)
B	D	A		
1		7	AIR RECEIVER TANK Drain condensation from tank. Release all air from the air receiver by opening the draincock.	0.1
2		8	FUEL TANK Check the fuel supply. See that the fuel tank is full. Add fuel as required.	0.1
3		9	DRAINCOCK Inspect the draincock for leaks. Make sure it is open before starting engine.	0.1
4		10	V-BELTS Inspect the belt set for wear, fraying, peeling and belt tension. Visually inspect for cracking. Inspect belt tension by pressing on the belts midway between engine pulley and compressor flywheel, if depression is more than one half inch (1.27 cm), adjust the belt set. Refer to organizational PMCS for adjustment.	0.2
5		11	OIL LEVEL SIGHT GAGE Check oil level. Add oil if required.	0.1
6		12	FIRE EXTINGUISHER Inspect for full charge and proper working condition. Refer to paragraph 3-15.	0.1
7		13	AIR CLEANER, COMPRESSOR Inspect the air cleaner for insecure mounting, wear, and damage. Service the air cleaner as specified in the lubrication order, Figure 3-1. or Figure 3-1.1. Repair or replace the air cleaner, if necessary, paragraph 3-9.	0.1



TS 023943

1. Air receiver tank
2. Fuel tank
3. Pressure gage
4. Safety valve
5. Globe valve
6. Draincock
7. V-belts
8. Oil level sight gage

Figure 3-2. Preventive maintenance services, models BGR-5M-1 and HGR5-8M-1.

Section III. TROUBLESHOOTING

3-5. General

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the air compressor. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help to determine probable causes and corrective action to be taken. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections, and corrective action. If a malfunction is not listed or is not corrected by corrective actions, notify your supervisor.

3-6. Operator Maintenance Troubleshooting

Refer to Table 3-2 for troubleshooting pertaining to operator's maintenance.

Table 3-2. Troubleshooting

Malfunction Test or inspection Corrective Action
1. ENGINE FAILS TO START Refer to TM 5-2805-203-14 for troubleshooting procedures.
2. ENGINE STOPS Refer to TM 5-2805-203-14 for troubleshooting procedures.
3. COMPRESSOR OVERHEATS *Step 1.* Inspect air cleaner for clogging. **Clean air cleaner by washing parts in soapy water, rinse and dry thoroughly.** *Step 2.* Inspect baffles for an accumulation of dirt or dust. **Clean baffles with dry compressed air.** *Step 3.* Check crankcase oil level. **Add oil in accordance with lubrication order, Figure 3-1.**
4. COMPRESSOR PUMPS TOO SLOWLY *Step 1.* Inspect the belt set for wear, fraying, or peeling. Inspect belt tension by pressing on the belts midway between engine pulley and compressor flywheel. **If depression is more than one half inch (1.27 cm), refer to organizational maintenance for adjustment. If belts are damaged, refer to organizational maintenance for replacement.** *Step 2.* Inspect air cleaner for clogging. **Clean air cleaner by washing parts in soapy water, rinse and dry thoroughly.** *Step 3.* Check oil level. **Add oil to crankcase, refer to Figure 3-1.**
5. COMPRESSOR FAILS TO BUILDUP PRESSURE Inspect air cleaner for clogging. **Clean air cleaner by washing parts in soapy water, rinse and dry thoroughly.**
6. COMPRESSOR NOISY Check oil level. **Add oil to crankcase, refer to Figure 3-1.**
7. V-BELTS WORN EXCESSIVELY Inspect the belt set for wear, fraying, or peeling. Inspect belt tension by pressing on the bolts midway between engine pulley and compressor flywheel. **If depression is more than one half inch (1.27 cm), refer to organizational maintenance for adjustment. If belts are damaged, refer to organizational maintenance for replacement.**

Section IV. MAINTENANCE PROCEDURES

3-7. General

The instructions in this section are published for information and guidance of the operator to maintain the air compressor.

3-8. V-Belts

a. Inspection.

(1) Inspect belts for fraying, cracks, and wear.

(2) Inspect for loose adjustment.

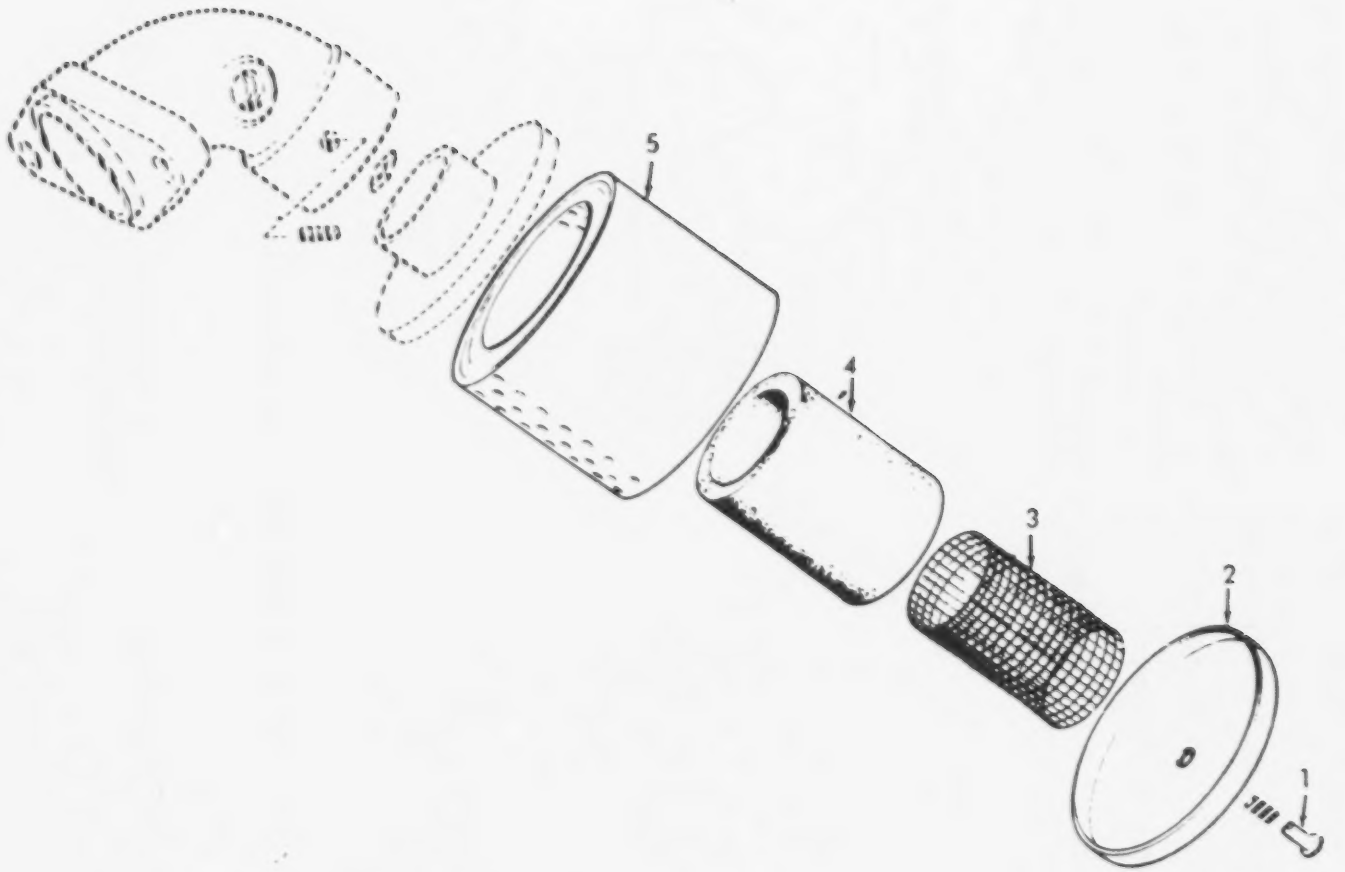
b. Adjustment and Replacement. Refer to organizational maintenance for removal and adjustment.

3-9. Compressor Air Cleaner

a. Disassembly.

(1) Remove the bolt (1, fig. 3-3) securing the cover (2).

(2) Remove the screen (3) and element (4) from the plate (5).



1. Bolt
2. Cover
3. Screen
4. Element
5. Plate

Figure 3-3. Compressor air cleaner, exploded view.

b. Cleaning, Inspection and Repair.

(1) Wash all parts in soapy water, rinse and dry thoroughly.

(2) Inspect for damaged parts and replace as necessary.

c. Assembly.

(1) Install element (4, fig. 3-3) and screen (3) in plate (5).

(2) Install cover (2) and secure with bolt (1).

3-9.1. Compressor Air Cleaner

a. Disassembly.

(1) Remove wing nut (1, fig. 3-3.1, Model HGR5-8M-6) securing upper cover (2).

(2) Remove element (3) from separator (4) and plate (5).

(3) Remove separator (6), upper cover (7) and ferrule from T-stud (9).

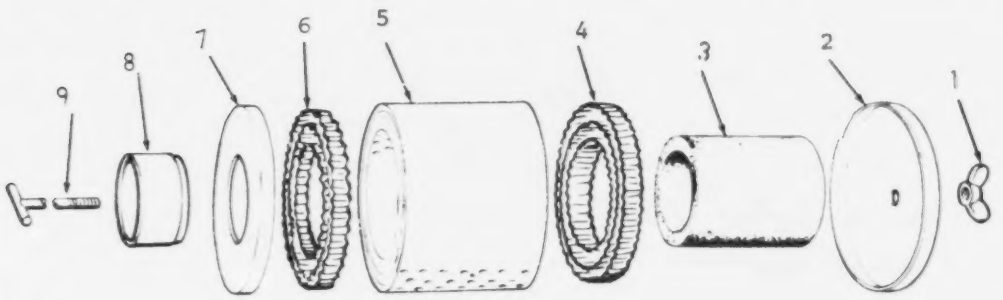
b. Cleaning, Inspection and Repair.

(1) Wash all parts in soapy water, rinse and dry thoroughly.

(2) Inspect for damaged parts and replace as necessary.

c. Assembly.

(1) Install ferrule (8, fig. 3-3.1) upper cover (7) separator (6) plate (5) separator (4) element (3) lower cover (2) and secure with wing nut (1).



1. Wing nut
2. Lower cover
3. Element
4. Separator
5. Plate
6. Separator
7. Upper cover
8. Ferrule
9. T-stud

Figure 3-3.1. Compressor air cleaner, exploded view (used on model HGR5-8M-6).

3-10. Compressor Oil Filler Plug

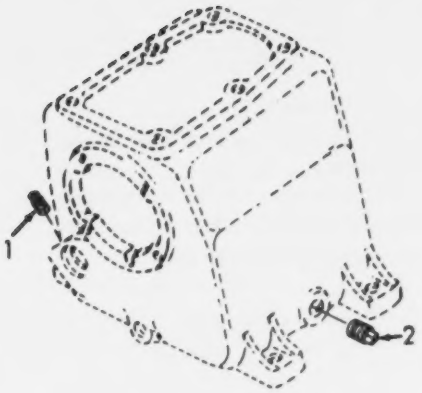
a. Removal.

(1) Stop the engine.

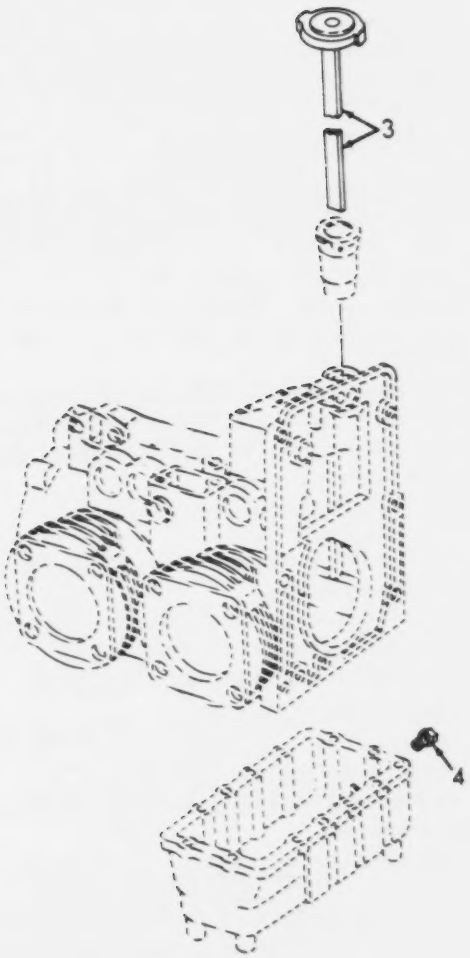
(2) Remove the oil filler plug (1, fig. 3-4) from the compressor crankcase.

Key to figure 3-4.

1. Plug
2. Plug
3. Filler cap
4. Plug



A. Compressor Crankcase Plugs



B. Engine Plugs

TS 023945

Figure 3-4. Oil filler and drain plugs, removal and installation.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) —138° F. (59° F. (59° C.).

(1) Clean the plug with cleaning solvent, Federal Specification P-D-680, and dry the plug thoroughly.

(2) Inspect plug for cracks, breaks, dents or damaged threads. Replace if defective.

c. Installation. Install the oil filler plug (1, fig. 3-4).

3-11. Compressor Oil Drain Plug

a. Removal.

(1) Remove the oil filler plug (1, fig. 3-4).

(2) Remove the oil drain plug (2). Drain oil from crankcase.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

(1) Clean removed parts in cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect plug for cracks, breaks, dents or damaged threads.

(3) Replace plug if defective.

c. Installation.

(1) Install the oil drain plug (2, fig. 3-4) in the compressor crankcase.

(2) Fill the compressor crankcase in accordance with the lubrication order, figure 3-1.

(3) Install the oil filler plug (1, fig. 3-4).

3-12. Engine Oil Filler Cap

a. Removal.

(1) Stop the engine.

(2) Remove the oil filler cap (3, fig. 3-4) from the engine crankcase.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° C. (59° C.).

(1) Clean the cap with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect for cracks, breaks, dents, or damaged threads. Replace if defective.

c. Installation. Install the oil filler cap (3, fig. 3-4).

3-13. Air Receiver

a. Inspection. Inspect for cracks, breaks, and other damage.

b. Replacement. Refer to organizational maintenance for removal and replacement.

3-14. Engine Oil Drain Plug

a. Removal.

(1) Remove the engine oil filler cap (3, fig. 3-4).

(2) Remove the engine oil drain plug (4, fig. 3-4). Drain oil from crankcase.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

(1) Clean all parts in cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the oil drain plug for cracks, breaks, dents, or damaged threads. Replace defective parts.

c. Installation.

(1) Install the oil drain plug (4, fig. 3-4) in the engine crankcase.

(2) Fill the engine crankcase in accordance with the lubrication order. Refer to LO 5-2805-203-14.

(3) Install the engine oil filler cap (3, fig. 3-4).

3-15. Fire Extinguisher (MONOBROMOTRIFLUOROMETHANE TYPE)

a. Description. The monobromotrifluoromethane type fire extinguisher is generally suitable for all types of fire, except fires involved with LOX (liquid oxygen) generating equipment. The fire extinguisher is furnished with a disposable type cylinder.

b. Operation. To operate the fire extinguisher, perform the following:

(1) Remove fire extinguisher from its location.

(2) Break seal by pulling safety pin from handle.

(3) Point horn at base of flame.

(4) Press trigger for discharge and direct stream at base of flame.

(5) Replace cylinder immediately after using.

c. Replacement of Cylinder. To replace cylinder, perform the following:

(1) Press lever to release pressure from used cylinder.

(2) Loosen swivel valve coupling nut and remove valve assembly from used cylinder.

(3) Remove instruction band from used cylinder.

(4) Place new cylinder through instruction band.

(5) Replace safety pin in valve and seal pin with sealing wire.

(6) Attach valve assembly and tighten swivel coupling nut on the new cylinder and place fire extinguisher in mounting bracket.

(7) Adjust instruction bank on cylinder to show maintenance and operating instructions.

d. Maintenance. Weigh fire extinguisher every 3 months and replace cylinder if gross weight has decreased 4 ounces (112 grams) or more. Lubricate cylinder neck threads with one drop of OE-30 oil before reassembly.

3-16. Fire Extinguisher (Carbon Dioxide Type)

a. Description. The carbon dioxide type fire extinguisher is suitable for electrical and flammable liquid fires. The carbon dioxide types are of the 4 pound (1.8 kg), 7½ pound (3.4 kg), and 10 pound (4.5 kg) sizes. The 4 pound (1.8 kg) extinguisher is portable; the other two are the fixed type.

b. Operation. Remove fire extinguisher from its location; break the seal, operate the control valve, and direct the stream at the base of the flame.

c. Maintenance. For maintenance of the fire extinguisher, refer to TM 5-687 and TM 9-1799.

3-17. Fire Extinguisher (Dry Chemical Type)

a. Description. The dry chemical type fire extinguisher is suitable for use on all types of fire and is effective in areas where ambinet temperature is—25° F. (—32°C.) and above. The fire extinguisher is a 2½ pound (1.1 kg), stored pressure, lever operated extinguisher.

b. Operation. Remove the fire extinguisher from its location, lift the handle, press lever, and direct the powder at the base of the flame using a side-to-side sweeping motion.

c. Maintenance. Weigh the fire extinguisher every six months and replace the extinguisher if weight is less than 4½ pounds (2 kg) or if pressure is below 125 pounds. Refer to SB5-111. The dry chemical fire extinguisher will be serviced at installation level through Repair and Utilities facilities, with the filling agent supplied by local procurement through Troop Supply channels.

CHAPTER 4

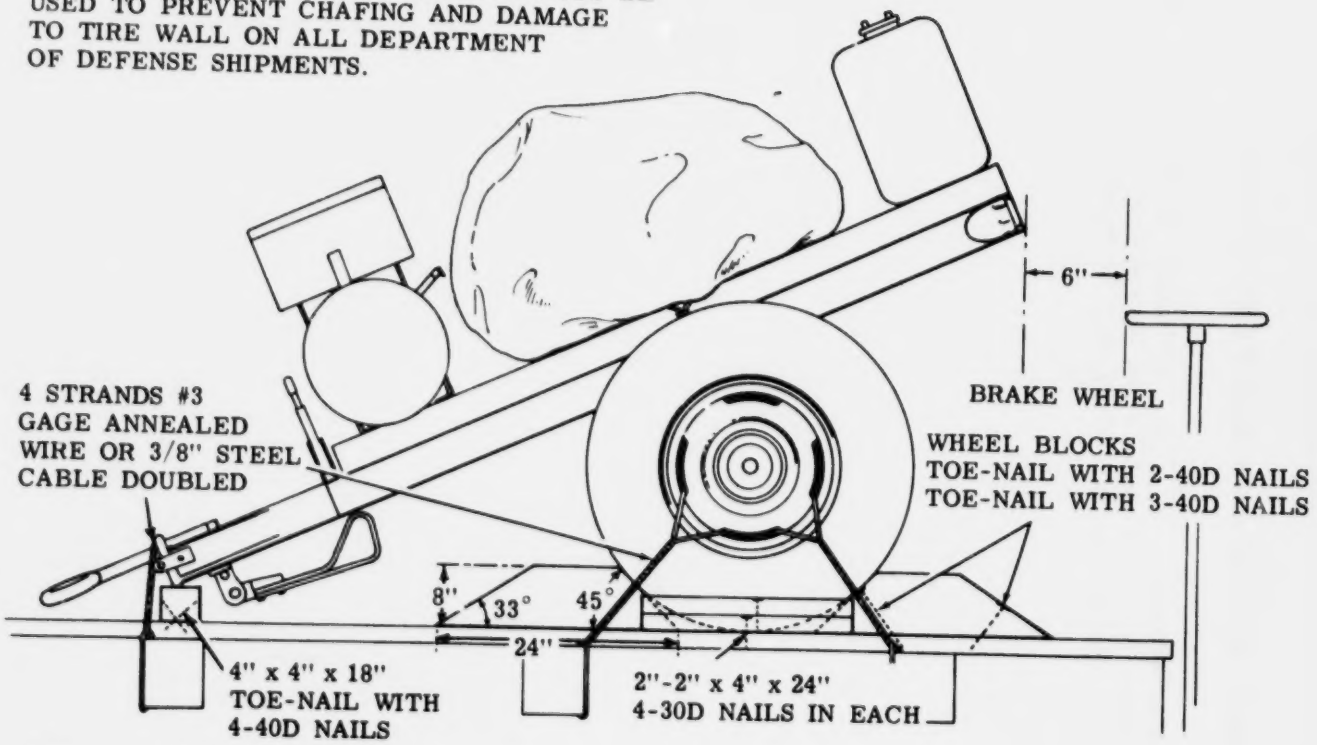
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspecting and Servicing Equipment

a. In the event the equipment is received via carrier proceed with unloading the equipment as follows:

(1) Remove all tie-downs or blocking that secure the trailer mounted air compressor, Model BGR-5M-1, to the carrier. Refer to figure 4-1.


SUITABLE PROTECTIVE MATERIAL BETWEEN TIRES OF UNIT AND SIDE BLOCKING MUST BE USED TO PREVENT CHAFING AND DAMAGE TO TIRE WALL ON ALL DEPARTMENT OF DEFENSE SHIPMENTS.
6"
BRAKE WHEEL
4 STRANDS #3 GAGE ANNEALED WIRE OR 3/8" STEEL CABLE DOUBLED
WHEEL BLOCKS
TOE-NAIL WITH 2-40D NAILS
TOE-NAIL WITH 3-40D NAILS
8"
33°
45°
24"
4" x 4" x 18" TOE-NAIL WITH 4-40D NAILS
2"-2" x 4" x 24" 4-30D NAILS IN EACH

3/8	=	.10	CM	2	=	5.1	CM
4	=	10.2	CM	2	=	5.1	CM
4	=	10.2	CM	4	=	10.2	CM
18	=	45.7	CM	24	=	61	CM
8	=	20.3	CM	6	=	15.2	CM
24	=	61	CM				

TS 023946

Figure 4-1. Shipping tie-downs, model BGR-5M-1.

(2) Remove all tie-downs or blocking that secure the crated air receiver mounted air compressor, Models HGR5-8M-1 and HGR5-8M-6, to the carrier. Refer to figure 4-2.

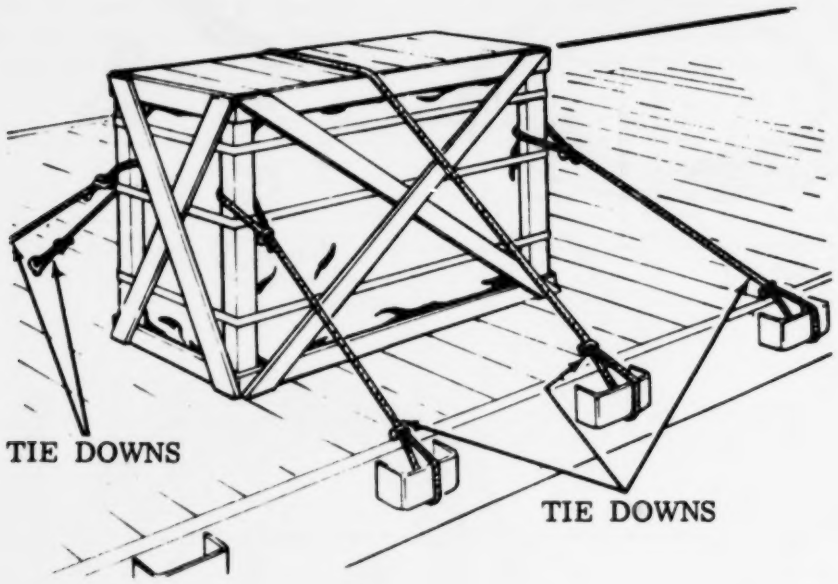


Figure 4-2. Shipping tie-downs, models HGR5-8M-1, and HGR5-8M-6.

WARNING

Make certain any lifting device used has a capacity equal to the weight being lifted. Failure to observe this precaution could result in injury or death to personnel and damage to the equipment.

(3) The trailer mounted air compressor, Model BGR-5M1, may be towed off the carrier if a suitable ramp is provided, or lifted off with a hoist or crane by attaching suitable slings to the lifting eyes on the trailer. A forklift truck, pipe rollers, or a suitable hoist must be used when removing the air receiver mounted air compressor, Models HGR5-8M-1 and HGR5-8M-6, from the carrier.

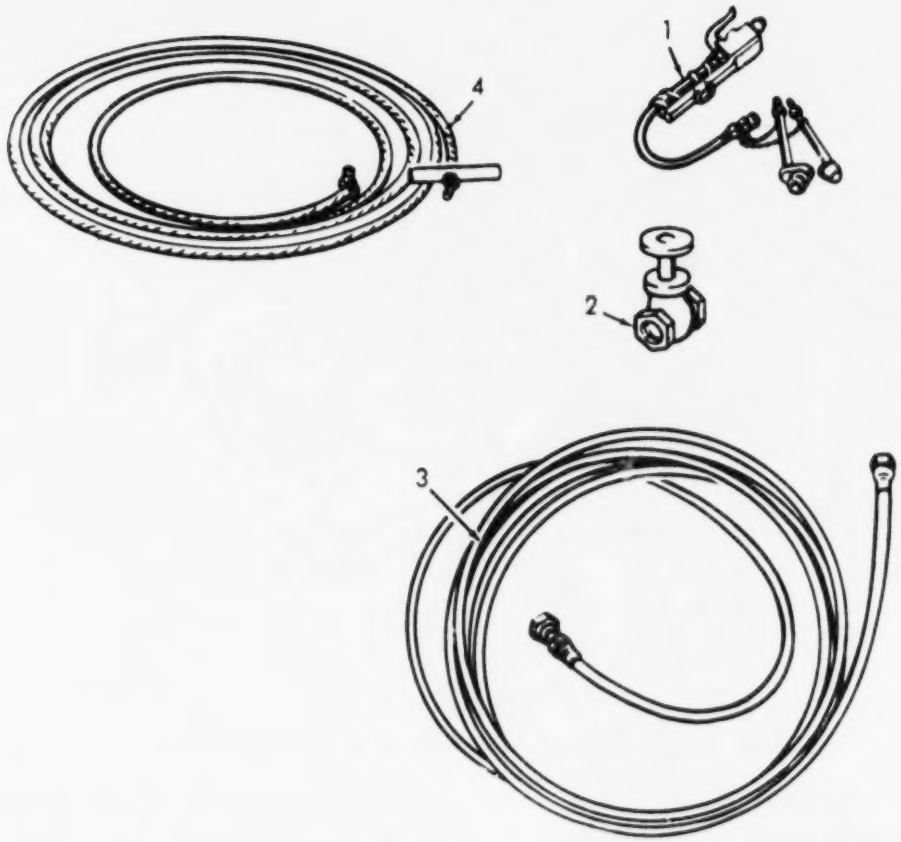
b. If some units and components are packaged or crated, proceed as follows to remove packaging or crate, whichever applies.

(1) Models BGR-5M-1, and HGR5-8M-6.

(*a*) Place the air compressor assembly as close to the point where it is to be used as possible.

(*b*) Remove the canvas protective cover.

(*c*) Remove the box containing the air hose assembly, inflator gage, and starter rope. These are shown in Figure 4-3.



1. Inflator gage
2. Globe valve (model HGR5-8M-1 and HGR5-8M-6)
3. Hose assembly
4. Starter rope

Figure 4-3. Separately packed components.

(*d*) Remove the cloth sack containing the tool box padlock keys. The sack is tied to the engine.

(2) Model HGR5-8M-1.

(*a*) Remove the crate, being careful not to damage the unit. Remove the four nuts and lockwashers that secure the air compressor assembly to the bottom of the crate and remove the air compressor.

(*b*) Remove the box containing the air hose assembly, inflator gage, globe valve, and starter rope. These are shown in figure 4-3.

(*c*) Remove the tape and protective material from the engine, compressor, and air receiver. Remove the preservative lubricant from the engine and compressor crankcase.

c. Make a complete visual inspection of the air compressor for any loss or damage that may have occurred during shipment. Prior to inspection or operation of the air compressor, accomplish depreservation of the equipment as outlined on DA Form 2258.

d. Perform the preventive maintenance services, table 4-2.

e. Inspect the air compressor for oil leaks, loose mounting bolts or nuts, cracks, breaks, dented or pinched tubing, and other defects.

f. Inspect the spark plug and cable. See that the carburetor is securely mounted and that the fuel lines are secure and are not cracked, broken, or

crimped. Check that the glass bowl on the fuel filter is secure and not cracked or broken.

g. Correct all deficiencies or report them to the proper authority.

WARNING

Do not fill the fuel tank while the engine is running. Be sure there are no open flames that may ignite the fuel vapors while the tank is being filled. Always provide a metal-to-metal contact between the container and tank to prevent a spark from being generated as gasoline flows over the metallic serfaces.

h. The maintenance and operating supplies required for the initial eight hours of operation for the compressor are contained in table 4-1.

Table 4-1. Maintenance and Operating Supplies

(1) Component application	(2) National stock number	(3) Description	(4) Quantity required f initial operation	(5) Quantity required f h hrs operation	(6) Notes
5001-Crankcase (1)		Lubricating Oil: 5 gal (19 liters) pail as follows:			(1) Includes quantity to fill compressor crankcase as follows:
		OE-30	2 1/8 qt (2 liters)	(2)	2 1/8 qt – crankcase
		OE-10	2 1/8 qt	(2)	
		OES	2 1/8 qt	(2)	
0306-Fuel Tank	9130-00-160-1816	Fuel, Gasoline: Bulk, automotive	9.2 gal (3) (35 liters)	6.4 gal (24 liters)	(2) See LO for application and intervals. (3) Tank capacity. (4) Average fuel consumption is .8 gal (3 liters) per hour.

4-2. Installation

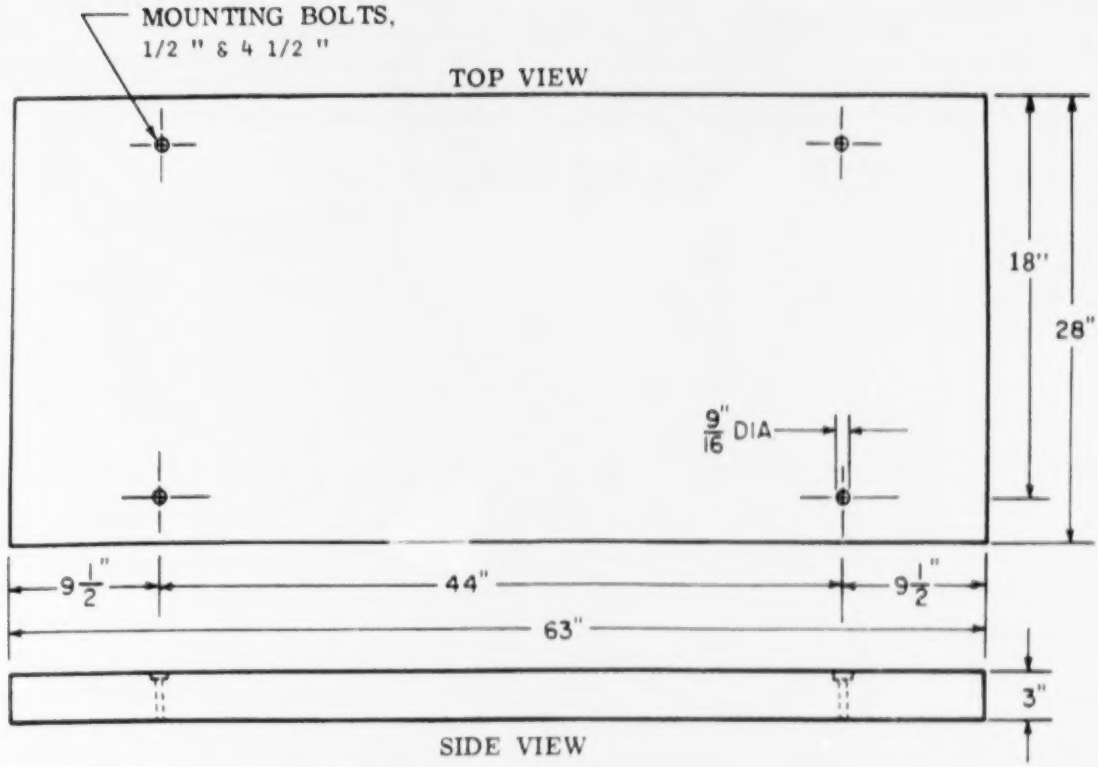
a. Installation of Separately Packed Components.

(1) The air compressor is delivered with an air hose assembly, inflator gage (and globe valve with Models HGR5-8M-1 and HGR5-8M-6), packed separately.

(2) Install the air hose assembly, inflator gage, and globe valve as illustrated in figure 4-5.

b. Installation or Setting Up Instructions.

(1) *General.* Model BGR-5M-1 is primarily designed for mobile field use when trailer mounted and requires no special base. The Models HGR5-8M-1, and HGR5-8M-6 set directly on four feet welded to the bottom of the air receiver and may be permanently installed if desired. If a permanent base is to be constructed, refer to figure 4-4.



1/2	=	1.3 CM	9/16	=	1.4 CM
4 1/2	=	11.5 CM	9 1/2	=	24.2 CM
9 1/2	=	24.2 CM	3	=	7.6 CM
44	=	111.8 CM	18	=	45.7 CM
63	=	160 CM	28	=	71.1 CM

TS 023949

Figure 4-4. Mounting base plan, model HGR5-8M-1, and HGR5-8M-6.

(2) *Location.* If possible avoid muddy, sandy, or dusty location as a site for installation as dirt and moisture shorten the life of all moving parts.

(3) *Leveling.* The air compressor should be as level as possible when installed or set up for use.

WARNING

When operating in an enclosed area, pipe exhaust gases to the outside by extending exhaust pipe. The exhaust gases contain carbon monoxide, a colorless and odorless poisonous gas. Inhalation of exhaust fumes will result in serious illness or death.

(4) *Installation.* If the compressor is to be installed within a building or vehicle, pipe the exhaust to the outside. Use as few bends as possible in the exhaust line and make sure all connections are tight.

(5) *Noise hazard warning signs.* Signs conforming to provisions of AR 385-30 will be erected in the area to provide notification of NOISE HAZARD in accordance with TB MED-251. The signs should read:

WARNING

Noise Hazard Equipment Hearing Protection Required.

Section II. MOVEMENT TO A NEW WORK SITE

4-3. Dismantling for Movement

a. Build up the pressure in the air receiver to just below 140 psi (9.8420 kg per sq cm).

b. Stop the engine. Open the draincock and blow the condensation from the air receiver. Close the draincock.

c. Drain the fuel tank.

d. Remove the air hose assembly and inflator gage (fir. 4-5) also remove the globe valve on Model HGR5-8M-1, and Model HGR5-8M-6. Cover the opening to the air receiver, hose ends, and opening to inflator gage with suitable plugs, caps, or tape to prevent foreign matter from entering.

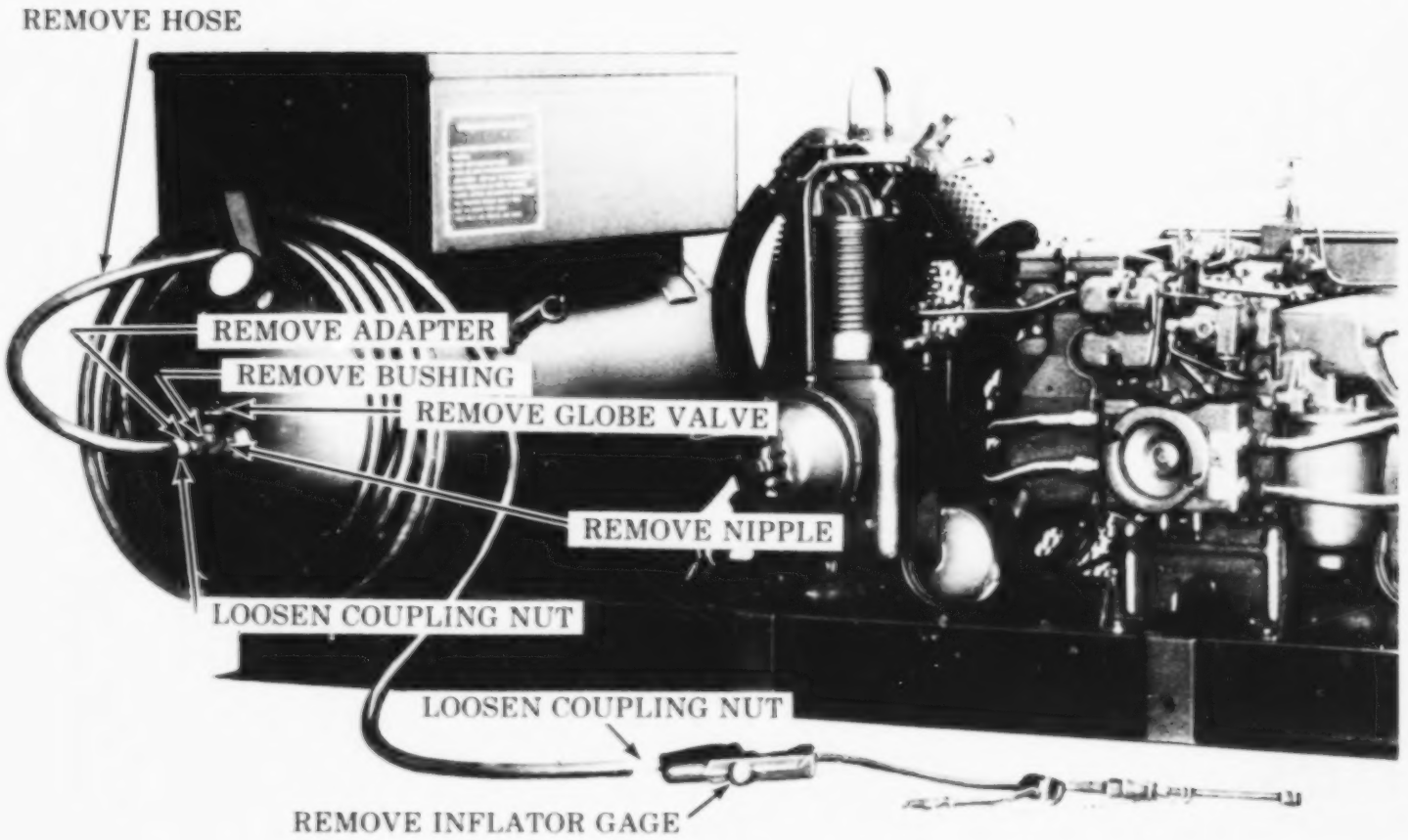


Figure 4-5. Globe valve, air hose assembly and inflator gage, removal and installation

e. Lift or tow the air compressor on a suitable carrier. Block and tie down as shown in figures 4-1 and 4-2.

f. Move the air compressor to the new work site. Unload it and set it up for operation.

4-4. Reinstallation After Movement

Install the air compressor by following the instructions in paragraph 4-2.

Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-5. Special Tools and Equipment

No special tools or equipment are required by organizational maintenance personnel for the maintenance of the air compressor.

4-6. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in TM 5-4310-277-25P.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-7. General

To insure that the air compressor is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 4-8. Defects discovered during operation of the unit shall ne noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noticed during operation which would damage the equipment if operation were continued.

4-8. Preventive Maintenance Checks and Services

Refer to table 4-2 for the preventive maintenance checks and services.

NOTE

Visually inspect for evidence of lubricant and fuel leaks concurrently with service checks.

Table 4-2. Organizational Preventive Maintenance Checks and Services

Q - Quarterly
Total Man-Hours Required: 2.6

Sequence number	Item to be inspected procedure	Work time (M H)
1	LUBRICATION Inspect the units (s) for missing or damaged lubrication fittings and for signs of insufficient lubrication. Correct deficiencies noticed.	0.3
2	APPEARANCE Inspect the general appearance of the unit(s) paying particular attention to cleanliness, legibility of identification markings, and the condition of the paint. Correct the deficiencies noticed or report the deficiency to the proper authority.	0.1
3	ENGINE Refer to TM 5-2805-203-14 for preventive maintenance checks and services to be performed on the MIL-STD-ENG Model 4A032-11, NSN 2805-00-068-7512.	
4	FUEL TANK Inspect the fuel tank for signs of leaks and loose mounting. Tighten fuel tank mounting straps (para. 4-12), if necessary. Repair or replace a defective fuel tank, paragraph 4-12.	0.2
5	AIR RECEIVER TANK Inspect the air receiver tank for cracked, or broken welds, dents, and other damage. Tighten all leaky fittings. Replace a damaged air receiver tank, paragraph 4-37.	0.1
6	UNLOADER Inspect the centrifugal unloader and the unloader valve for leaks and improper operation. Repair a defective centrifugal unloader, paragraph 4-29.	0.2
7	INTERCOOLER Inspect the intercooler tube for loose and leaking connections, bends, breaks, and dirt. Tighten loose connections and clean with a brush and compressed air. Replace the intercooler tube if defective, paragraph 4-24.	0.1

Table 4-2. Organizational Preventive Maintenance Checks and Services—Continued

Q—Quarterly
Total Man-Hours Required: 2.6

Sequence number	Item to be inspected procedure	Work time (M H)
8	VALVE, COMPRESSOR Inspect the valves for the following: A leak in the low pressure intake valve is indicated by a hissing noise in the air cleaner. A constant blowing of low pressure safety valve indicates a leak in the high pressure valve. If necessary remove the valves and clean thoroughly, paragraph 4-28. Replace all damaged or worn parts, paragraph 4-28.	0.2
9	PRESSURE GAGE Inspect pressure gage for loose mounting or leaks. Observe the pressure gage for an indication of pressure being delivered to the air receiver tank. Normal operating pressure is 140 to 175 psi (9.8 to 12.3 kg per sq cm). Replace if defective, paragraph 4-33.	0.1
10	SAFETY VALVE Inspect safety valve for cracks and loose mounting. Replace if defective, paragraph 4-31.	0.1
11	GLOBE VALVE Inspect globe valve for leaks and loose mounting. Replace if defective, paragraph 4-34.	0.1
12	PILOT VALVE Inspect pilot valve for cracks or loose mounting. Replace if defective, paragraph 4-26.	0.1
13	OIL SIGHT INDICATOR Inspect oil sight indicator for cracks, or breaks. Replace if defective, paragraph 4-35.	0.1
14	BELT GUARD Inspect the belt guard for loose mounting, and missing hardward. Tighten or replace any loose or missing hardward, paragraph 4-18. Replace the belt guard if defective, paragraph 4-18.	0.1
15	FLYWHEEL, COMPRESSOR Inspect the flywheel for cracks and breaks. Inspect for accumulated dirt or debris that might restrict the flow of air. If flywheel is cracked or broken, replace it. Refer to paragraph 4-23.	0.1
16	V-BELTS Inspect the belt set for wear, fraying or peeling. Inspect belt tension by pressing on the belts midway between engine pulley and compressor flywheel. If depression is more than one half inch (1.27 cm), adjust the belt set. Refer to paragraph 4-19 for adjustment. If belts are damaged, replace them. Refer to paragraph 4-19 for replacement instructions.	0.2
17	CHECK VALVE Inspect the check valve for loose mounting or leaks. Replace if defective, paragraph 4-32.	0.1
18	AIR HOSES AND CONNECTIONS Inspect the hose assembly for leaks and cracks. Inspect all tubes for loose connections. Tighten all connections securely. Replace defective tubes, paragraph 4-23.	0.1

Section V. TROUBLESHOOTING

4-9. General

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the air compressor unit(s). Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help to determine probable causes and corrective action to be taken. Perform the tests/inspections and corrective action in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective action, see your supervisor.

4-10. Organizational Maintenance Troubleshooting

Refer to Table 4-3 for troubleshooting pertaining to organizational maintenance.

Table 4-3. Troubleshooting

Malfunction Test or Inspection Corrective Action
1. ENGINE MALFUNCTIONS
Refer to TM 5-2805-203-14 for troubleshooting procedures.
2. COMPRESSOR OVERHEATS
Step 1. Inspect belt tension by pressing on the belts midway between engine pulley and compressor flywheel. If depression is more than one half inch (1.27 cm), adjust the belt set as follows:
a. **Stop engine, and release the air from the compressor by opening the draincock.**
b. **Remove nut (fig. 4-6), lockwasher, washer and screw, remove bracket.**

Malfunction
Test or Inspection
Corrective Action

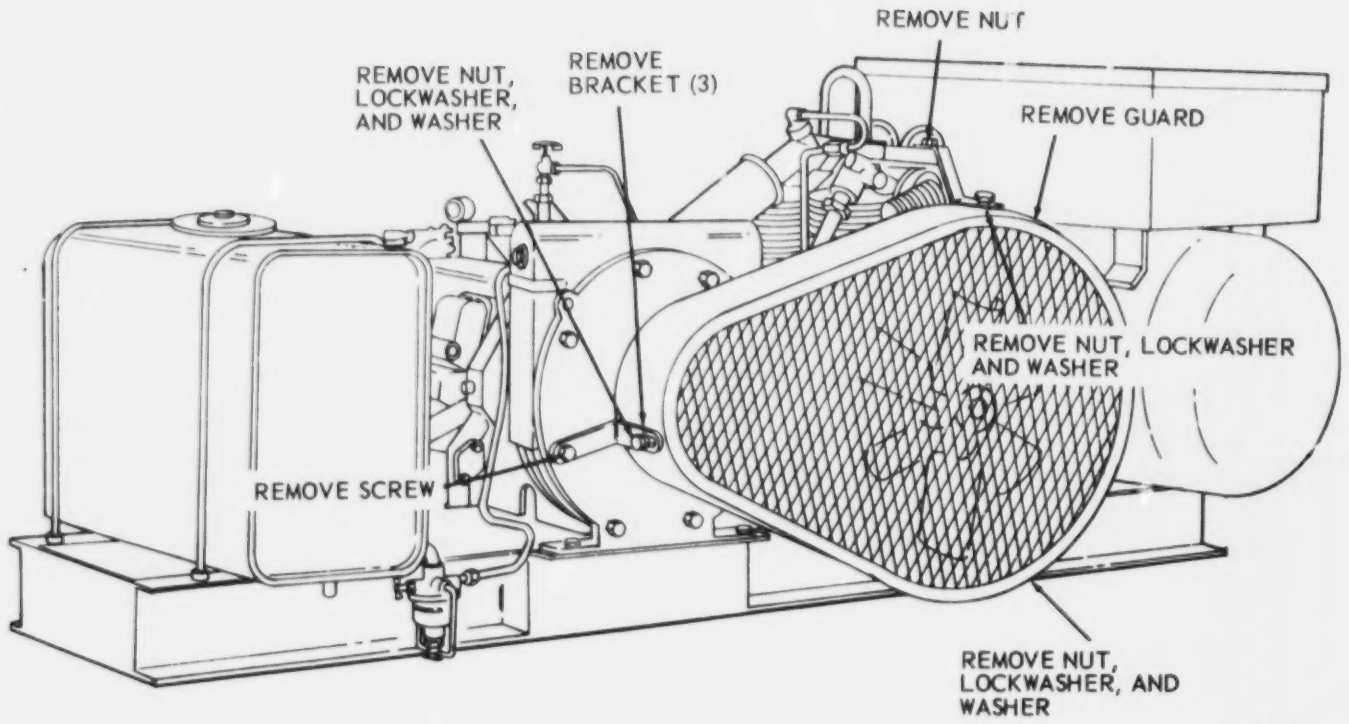


Figure 4-6. Belt guard, removal and installation.

Malfunction	Test or Inspection	Corrective Action

c. Remove nuts, lockwashers and washers and remove guard. Loosen engine attaching hardware (fig. 4-7). It is not necessary to remove the attaching hardware parts.

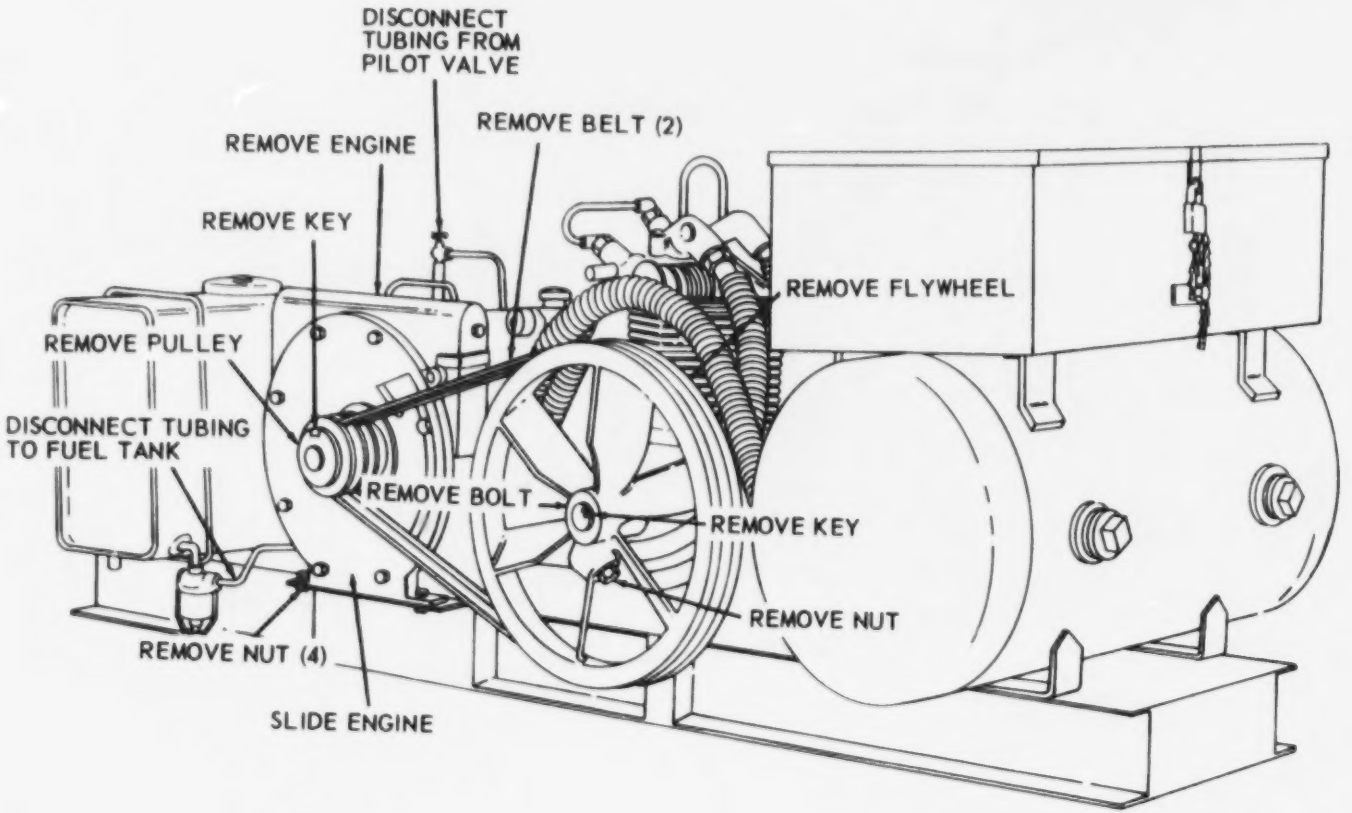


Figure 4-7. V-belts, drive pulley, flywheel, and engine, removal and installation.

Malfunction

Test or Inspection

Corrective Action

d. **Move the engine away from the compressor until there is tension on the V-belts. Depress belts until one half inch (1.27 cm) depression is obtained.**

e. **Tighten the engine mounting hardware. Be extremely careful that the engine is square in relation to the mounting base and flywheel to avoid binding and excessive wear of the V-belts.**

f. Install the belt guard.

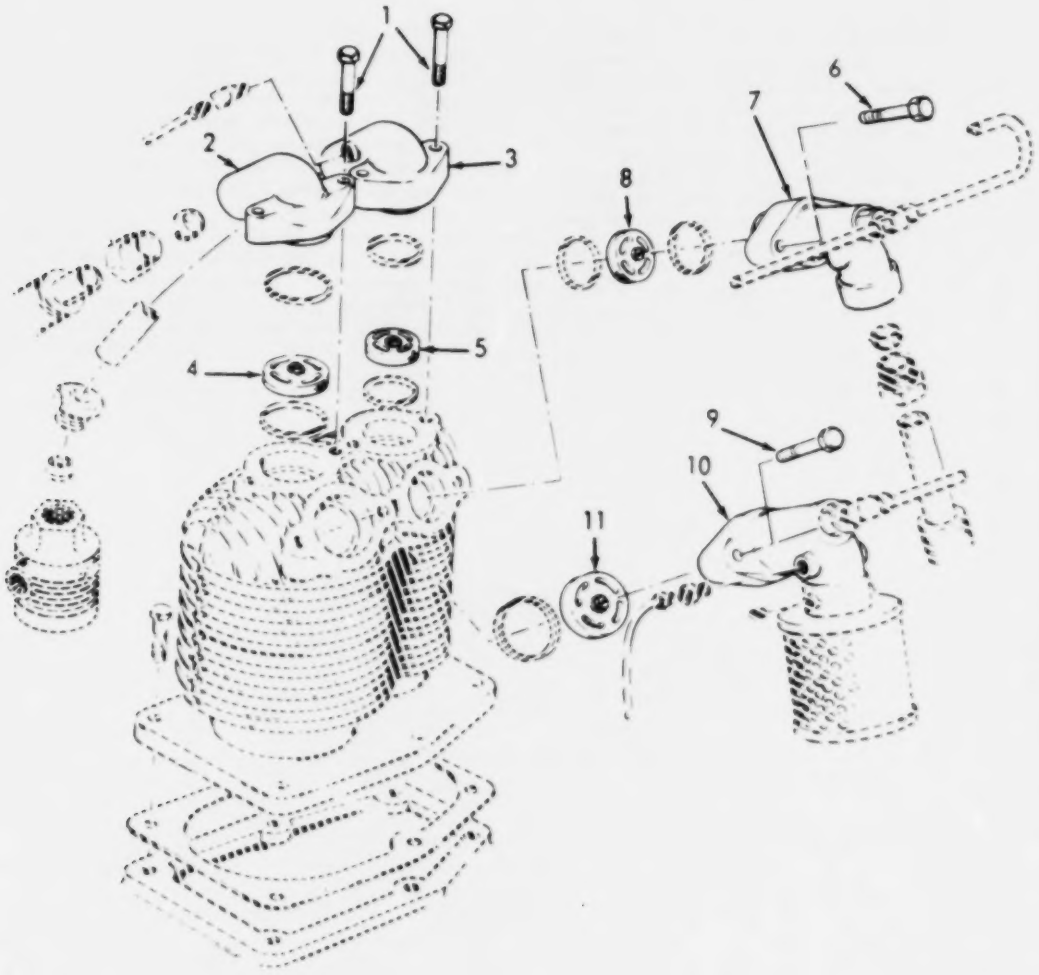
Step 2. Inspect aftercooler tube and check valve for carbon and wear.

Replace a damaged tube, paragraph 4-24. Replace or repair a damaged check valve, paragraph 4-32.

Step 3. Inspect all valve seats and cages for cracks, breaks, rough or scored seats, and mating surfaces. To check for damaged valves, disconnect necessary tubing and refer to Figure 4-8 and remove bolts (1, 6 and 9), manifolds (2, 3, 7 and 10), and valves (4, 5, 8 and 11). Disassemble the valves, Figure 4-9, as follows: Remove the four screws and lockwashers (1), intake valve seat (2), valve disc (3), valve spring (4), intake valve cage (5), valve gaskets (6 and 7), exhaust valve cage (8), valve spring (9), valve disc (10), exhaust valve seat (11), valve gaskets (12 and 13), intake valve seat (14), valve disc (15), valve spring (16), intake valve cage (17), valve gaskets (18 and 19), exhaust valve cage (20), valve spring (21), valve disc (22), exhaust valve seat (23), and valve gasket (24).

If valve components are damaged, replace them as necessary. Install the valve gasket (24, fig. 4-9), valve seat (23), valve disc (22), valve spring (21), exhaust valve cage (20), valve gaskets (18 and 19), intake valve cage (17), valve spring (16), valve disc (15), intake valve seat (14), valve gaskets (12 and 13), exhaust valve seat (11), valve disc (10), valve spring (9), exhaust valve cage (8), valve gaskets (6 and 7), intake valve cage (5), valve spring (4), valve disc (3), intake valve seat (2) and the four screws and lockwashers (1). After assembling new components, install the assembled valves (4, 5, 8 and 11, fig. 4-8). Install manifolds (2, 3, 7 and 10) and secure with bolts (1, 6 and 9). Reconnect all tubing.

Malfunction
Test or Inspection
Corrective Action

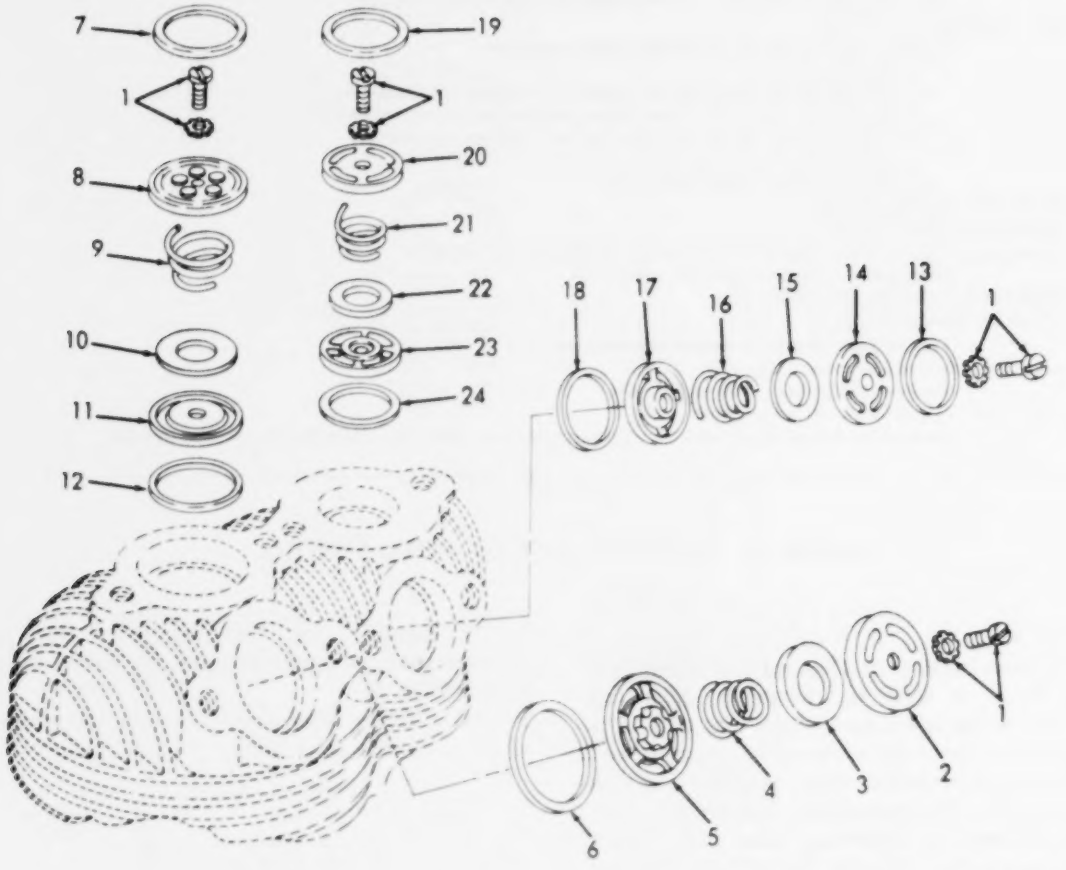


TS 023953

1. Bolt
2. Manifold
3. Manifold
4. Valve
5. Valve
6. Bolt
7. Manifold
8. Valve
9. Bolt
10. Manifold
11. Valve

Figure 4-8. Intake and exhaust valves, removal and installation.

Malfunction
Test or Inspection
Corrective Action



TS 023954

1. Screw and lockwasher	7. Valve gasket	13. Valve gasket	19. Valve gasket
2. Intake valve seat	8. Exhaust valve cage	14. Intake valve seat	20. Exhaust valve cage
3. Valve disc	9. Valve spring	15. Valve disc	21. Valve spring
4. Valve spring	10. Valve disc	16. Valve spring	22. Valve disc
5. Intake valve cage	11. Exhaust valve seat	17. Intake valve cage	23. Exhaust valve seat
6. Valve gasket	12. Valve gasket	18. Valve gasket	24. Valve gasket

Figure 4-9. Intake and exhaust valves, disassembly and reassembly.

3. **COMPRESSOR PUMPS TOO SLOWLY**
   See Malfunction 2, Step 1.
4. **COMPRESSOR FAILS TO BUILDUP PRESSURE**
   Step 1. Check for leakage in the system by using soap solution to check for leaks at all connections and other suspected points. Leakage will be evidenced by bubbles.
   Tighten connections.
   Step 2. Check for too much water in air receiver by opening the draincock.
   Drain water from air receiver.
   Step 3. Inspect aftercooler tube and check valve for carbon and wear.
   Replace a damaged tube, paragraph 4-24. Replace or repair a damaged check valve, paragraph 4-32.
   Step 4. See Malfunction 2, Step 3.

Malfunction Test or Inspection Corrective Action
5. COMPRESSOR NOISY
Step 1. Check for loose engine drive pulley or flywheel (fig. 4-7).
Tighten engine drive pulley or compressor flywheel (refer to fig. 4-7).
Step 2. Check for worn V-belts.
Replace worn V-belts using the following procedure:
a. **Stop the engine.**
b. **Release the air from the compressor by opening the draincock.**
c. **Remove nut (fig. 4-6), lockwashers, washer and screw, remove bracket.**
d. **Remove nuts, lockwashers and washers and remove guard.**
e. **Remove the V-belts as illustrated in Figure 4-7.**
f. **Replace worn V-belts and install.**
6. V-BELTS WORN EXCESSIVELY
Step 1. See Malfunction 2, Step 1.
Step 2. Check engine pulley and compressor flywheel for misalignment.
Align pulley and flywheel (refer to fig. 4-7).
7. COMPRESSOR VIBRATES EXCESSIVELY
Step 1. Check for loose mounting.
Tighten mounting bolts and/or mounting plates.
Step 2. Check flywheel alignment (fig. 4-7).
Realign the flywheel (refer to fig. 4-7).
Step 3. Check for a possible loose foundation.
Strengthen foundation or relocate air compressor on a solid base. Keep unit as level as possible.

Section VI. MAINTENANCE OF FUEL SYSTEM

4-11. General

The fuel system consists of a fuel tank, fuel line, and fuel line filter. A filler cap assembly, filler cap gasket, and screen are a part of the fuel tank. The fuel tank screen provides a means of trapping and preventing foreign matter from entering the fuel tank during fuel filling operations. The fuel line filter provides a means of removing water and foreign matter from the fuel. It is located between the fuel tank and carburetor.

4-12. Fuel Tank

a. Removal and Disassembly. Remove and disassemble the fuel tank assembly as follows:

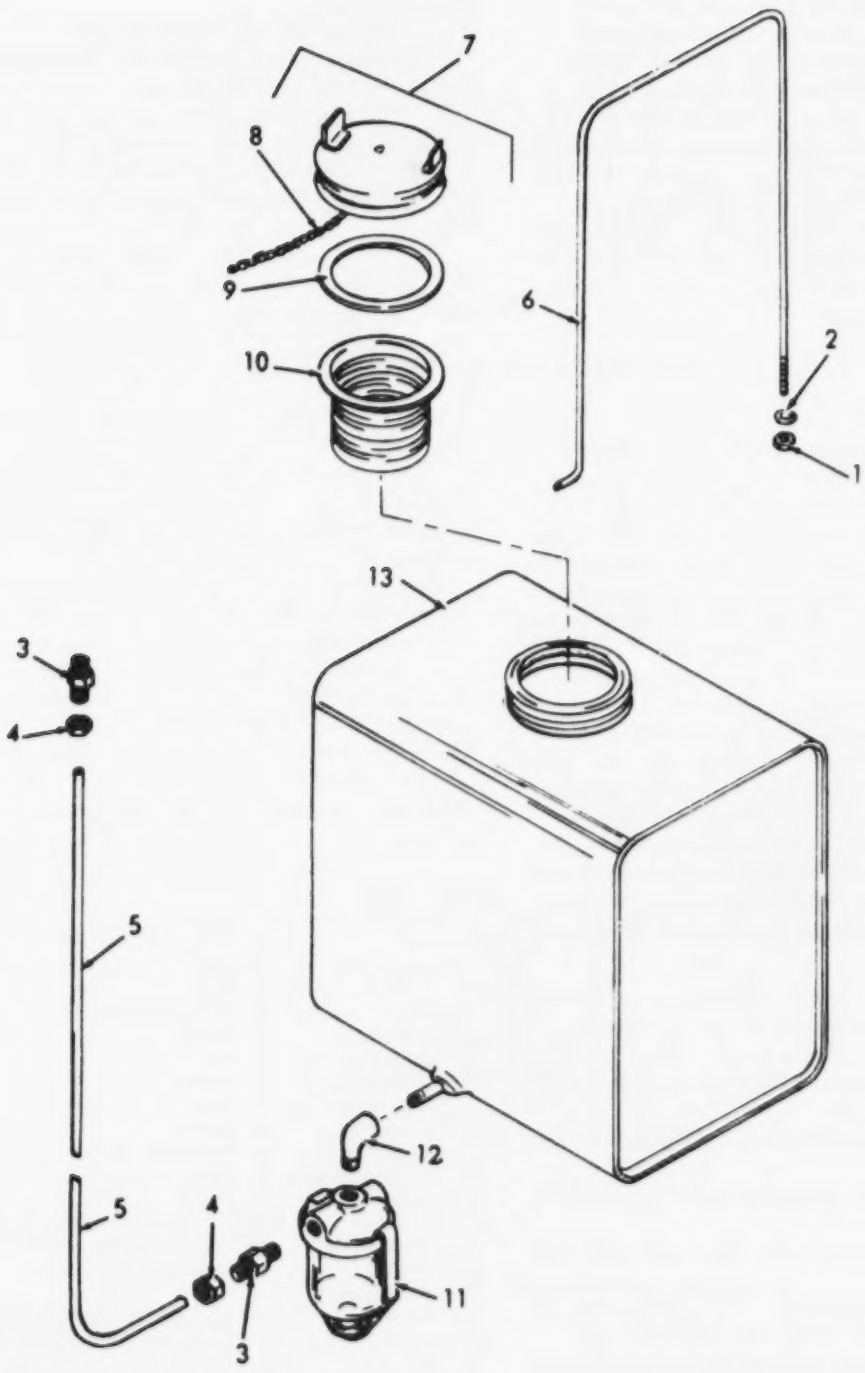
(1) Remove the nuts (1, fig. 4-10) and washers (2) mounting the strap (6).

(2) Remove bushings (3), nuts (4) and disengage line (5) and remove strap (6).

(3) Remove the cap assembly (7) and disassemble it by removing chain (8), gasket (9) and screem (10).

(4) Remove filter assembly (11) and unscrew elbow (12) from tank (13).

KEY to Figure 4-10.
1. Nut
2. Washer
3. Bushing
4. Nut
5. Line
6. Strap
7. Cap assembly
8. Chain
9. Gasket
10. Screen
11. Filter assembly
12. Elbow
13. Tank



TS 023955

Figure 4-10. Fuel tank, filter and related parts, exploded view.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean the inside and outside of the fuel tank and all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Blow out the fuel strainer screen with compressed air if available or wash thoroughly so that screen is free of all contamination and foreign matter. Clean filter bowl.

(3) Inspect all parts for cracks, breaks, dents, and other damage. Pay particular attention to breaks or cracks in the fuel line filter bowl and fuel strainer screen.

(4) Replace any defective part.

c. Assembly and Installation. Reassemble and install the fuel tank as follows:

(1) Install the elbow (12, fig. 4-10) on tank (13) and install the filter assembly (11).

(2) Assemble the cap assembly (7) by using a new gasket (9) and installing screen (10) and chain (8).

(3) Install the strap (6) and secure it with nuts (1) and washers (2); install line (5) and secure with bushings (3) and nuts (4).

Section VII. MAINTENANCE OF THROTTLE CONTROL

4-13. General

The throttle control system consists of a slowdown tube, compression valve, pneumatic cylinder, cylinder mounting bracket, and throttle arm. The slowdown tube carries air from the pilot valve on the compressor to the compression valve and pneumatic cylinder which is attached to the engine carburetor through a throttle arm. When the air compressor tank pressure rises to a predetermined pressure (approximately 175 psi) (12.3025 kg per sq cm) the compressor senses this and unloads the compressor at the same time pressurizes the pneumatic cylinder actuating the throttle arm which pushes the carburetor throttle plate back to a preset idle position. When the air receiver tank pressure drops to a predetermined air pressure (approximately 145 psi) (10.1935 kg per sq cm) the pilot valve closes off and bleeds the air supply to the pneumatic cylinder, permitting the throttle plate to return to normal operating position.

4-14. Throttle Arm, Valve, Pneumatic Cylinder, and Associated Parts

a. Removal.

(1) Remove the intercooler tubes (1, fig. 4-11), nuts (2) and ferrules (3).

(2) Remove aftercooler tube (4), nuts (5) and ferrules(6).

(3) Remove the unloading tube (7), nuts (8) and bodies (9).

(4) Remove breather tube (10), nuts (11) and bodies (12).

(5) Unscrew the setscrew (13) and free the air cleaner (14).

(6) Remove the manifold tube (15), nut (16) and body (17).

(7) Remove nuts (18), sleeves (19), and branch tee (20); remove actuating tubes (21).

(8) Remove nuts (22), sleeves (23), branch tee (24), and tubes (25).

(9) Disassemble valve (28) by removing nut (26) and sleeve (27).

(10) Remove cylinder (29) from bracket (30).

(11) Remove nut (31), screw (32), and arm (33).

(12) Remove the screws (34) securing the bracket (35) to the pilot valve (36).

(13) Remove the mounting screws (37) and remove the intake manifold (38); remove intake valve assembly (39).

(14) Remove the interstage safety valve (40) from the intake manifold (42); remove mounting screws (41) and manifold (42).

(15) Remove the intake valve assembly (43).

(16) Remove mounting screws (44), exhaust manifolds (45 and 46) and exhaust valve assembliies (47 and 48).

KEY to Figure 4-11

1. Intercooler tube	25. Tube
2. Nut	26. Compression nut
3. Tube ferrule	27. Sleeve
4. Aftercooler tube	28. Valve
5. Nut	29. Pneumatic cylinder
6. Tube ferrule	30. Bracket
7. Unloading tube	31. Nut
8. Compression nut	32. Screw
9. Compression body	33. Arm
10. Breather tube	34. Screw
11. Compression nut	35. Mounting bracket
12. Compression body	36. Pilot valve
13. Setscrew	37. Screw
14. Air cleaner	38. Low pressure intake manifold
15. Manifold tube	39. Low pressure intake valve assembly
16. Compression nut	40. Interstage safety valve
17. Compression body	41. Screw
18. Compression nut	42. High pressure intake manifold
19. Sleeve	43. High pressure intake valve assembly
20. Tee	44. Screw
21. Actuating tube	45. Low pressure exhaust manifold
22. Compression nut	46. High pressure exhaust manifold
23. Sleeve	47. Low pressure exhaust valve assembly
24. Tee	48. High pressure exhaust valve assembly

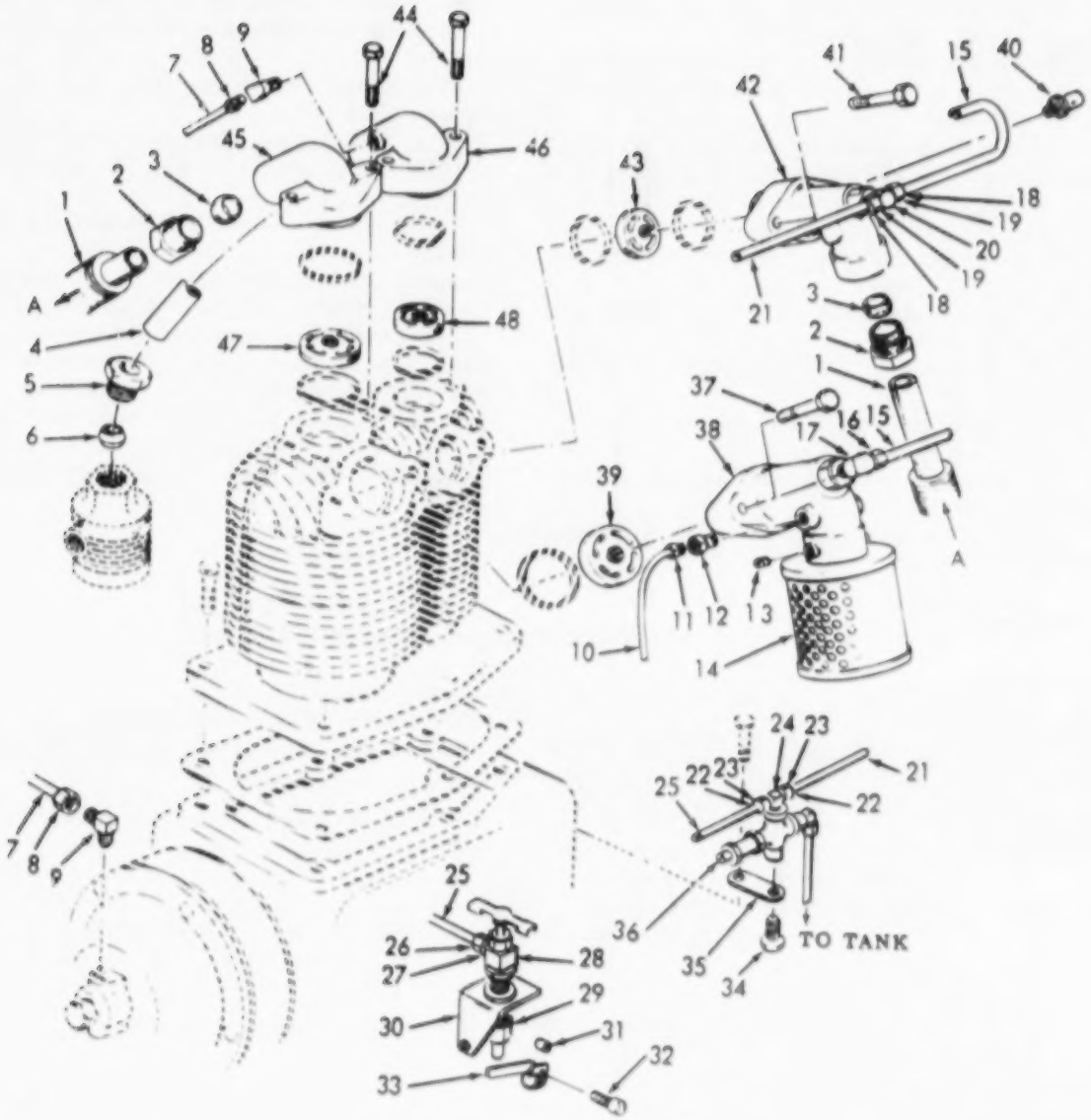


Figure 4-11. Manifolds, valves, tubes and fittings, exploded view.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean all parts in cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect all parts for cracks, breaks, dents,

and other damage. Inspect tubing for crimps and cracks.

(3) Replace any defective parts as necessary.

c. Assembly and Installation.

(1) Install the exhaust valve assemblies (47 and 48, fig. 4-11) and the exhaust manifolds (45 and 46), secure with screws (44).

(2) Install intake valve assembly (43); then, install intake manifold (42) and secure with screws (41). Install the interstage safety valve (40).

(3) Install the intake valve assembly (39). Install intake manifold (38) and secure with screws (37).

(4) Install bracket (35) to pilot valve (36) and secure with screws (34).

(5) Install arm (33) and secure with screw (32) and nut (31).

(6) Install bracket (30) and cylinder (29).

(7) Install sleeve (27) and nut (26) on valve (28).

(8) Install tubes (25), branch tee (24), sleeves (23) and nuts (22).

(9) Install actuating tubes (21), tee (20), sleeves (19) and nuts (18).

(10) Install body (17), nut (16) and tube (15).

(11) Install the air cleaner (14) back on the intake manifold and secure with setscrew (13).

(12) Install bodies (12), nuts (11), and breather tube (10).

(13) Install the bodies (9), nuts (8), and unloading tube (7).

(14) Install ferrules (6), nuts (5) and tube (4).

(15) Install ferrules (3), nuts (2), and intercooler tubes (1).

d. Adjustment. After installation of the throttle arm the idle position of the carburetor may be adjusted to attain proper idling of the engine. To adjust the throttle arm perform the following:

(1) Start the air compressor. Allow pressure to build up in air receiver until pilot valve activates (above approximately 175 psi) (12.3025 kg per sq cm) and pneumatic cylinder actuates throttle arm.

(2) Loosen nut, figure 4-11, and adjust screw until desired idling speed is obtained. Tighten nut.

Section VIII. MAINTENANCE OF EXHAUST SYSTEM

4-15. General

Two engine exhaust mufflers are attached to the exhaust pipe flange on either side of the engine and are further supported by brackets attached to the engine block.

4-16. Engine Muffler and Brackets

a. Removal. Remove the engine mufflers as shown in figure 4-12.

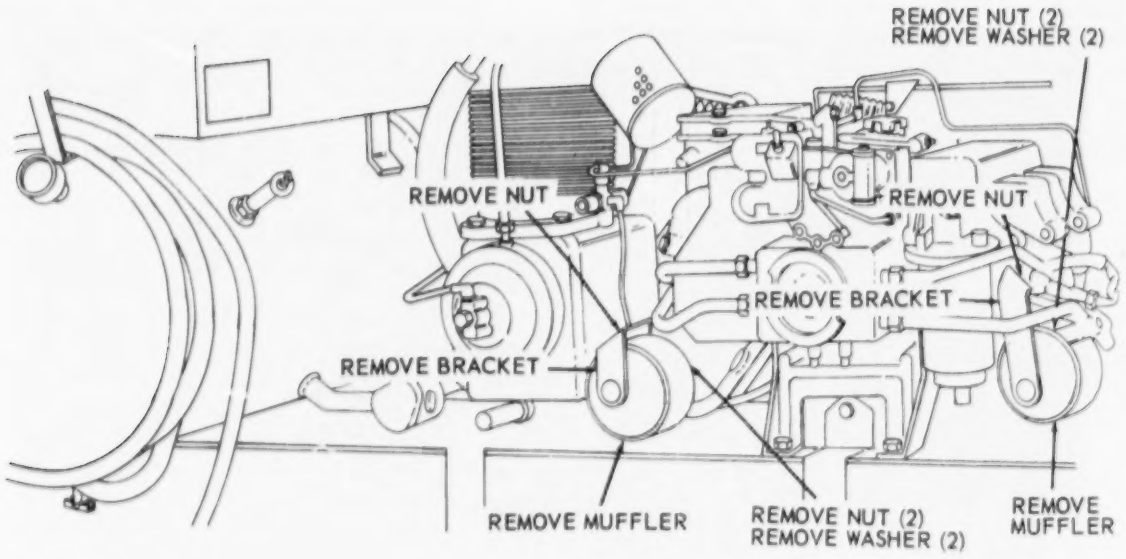


Figure 4-12. Engine muffler, removal and installation.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Use a wire brush on the muffler to remove any rust or corrosion that may have accumlulated.

(2) Inspect the muffler and attaching parts for cracks, breaks, damaged threads or other defects.

(3) Replace a defective part.

c. Installation. Install the engine muffler as shown in figure 4-12.

Section IX. MAINTENANCE OF TOOL BOX, MODEL BGR-5M-1

4-17. Tool Box Assembly

a. Removal. Remove the tool box as shown in Figure 4-13.

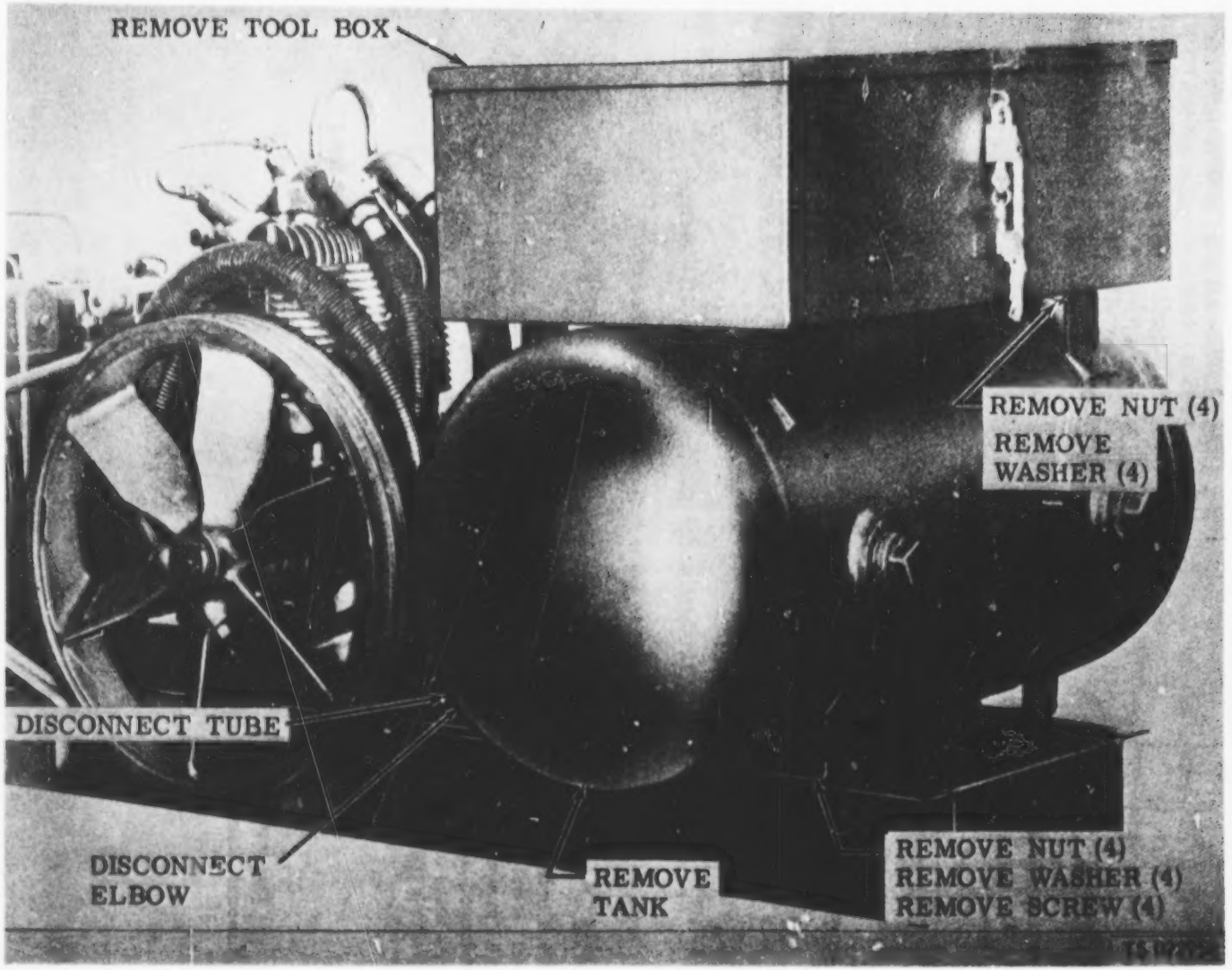


Figure 4-13. Tool box and air receiver, removal and installation.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean the tool box thoroughly inside and out with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Be careful not to damage or mar the instruction plate attached to the side of tool box.

(2) Inspect the interior and exterior of the box for cracks, dents, corrosion, and other damage. Inspect padlock for malfunction and padlock chain for broken links. Check all attaching parts for damaged threads.

(3) Replace any defective parts.

c. Installation. Install the tool box as shown in figure 4-13.

Section X. MAINTENANCE OF DRIVE PULLEY, BELT GUARD, AND BELT SET

4-18. Belt Guard

a. Removal.

(1) Stop the engine.

(2) Release the air from the compressor by opening the draincock.

(3) Remove the belt guard as illustrated in Figure 4-14.

WARNING

Do not operate the air compressor with the belt guard off.

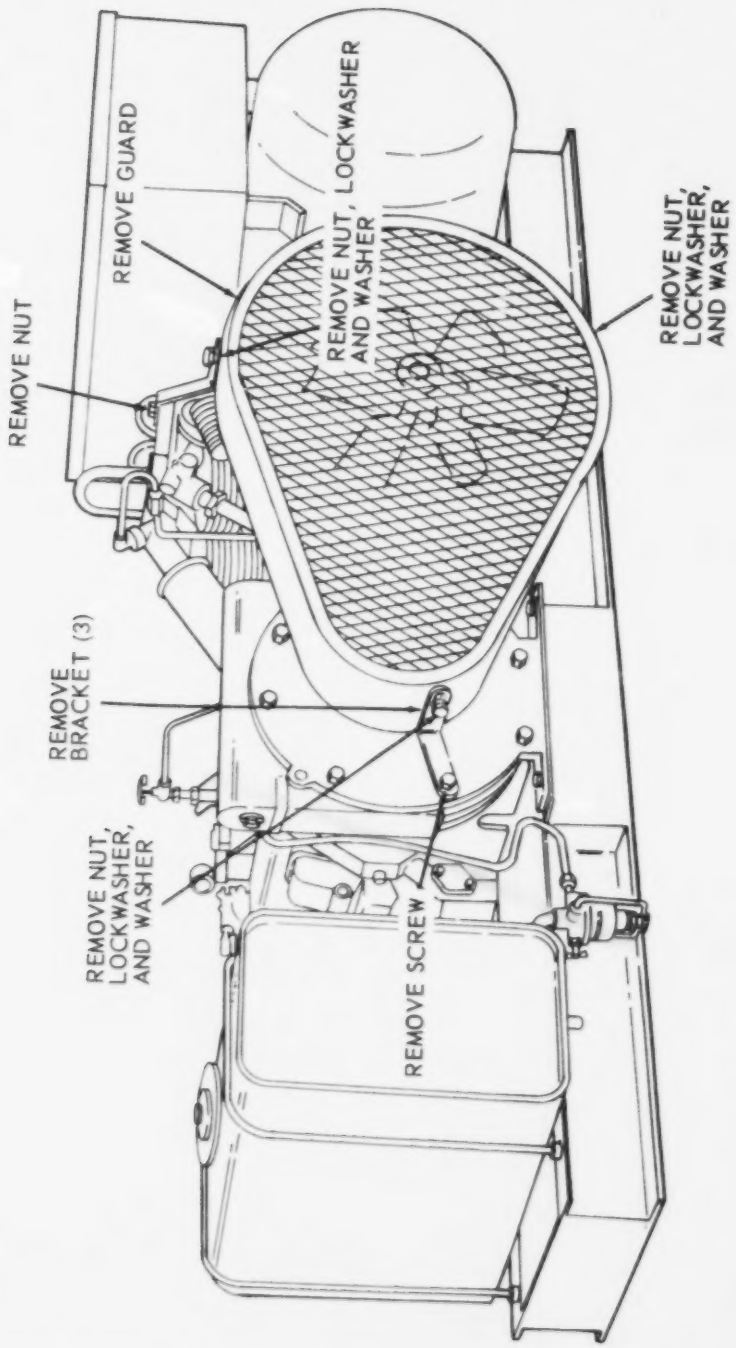


Figure 4-14 Belt guard, removal and installation.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean the parts in cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the belt guard and mounting brackets for dents, cracks, breaks or other damage. Straighten minor dents and bends in the guard and brackets. Inspect all attaching hardware for damaged threads.

(3) Replace damaged or defective parts.

c. Installation. Install the belt guard as illustrated in figure 4-14.

4-19. V-Belts

a. Removal.

(1) Stop the engine.

(2) Release the air from the compressor by opening the draincock.

(3) Remove the belt guard.

(4) Remove the V-belts as illustrated in figure 4-15.

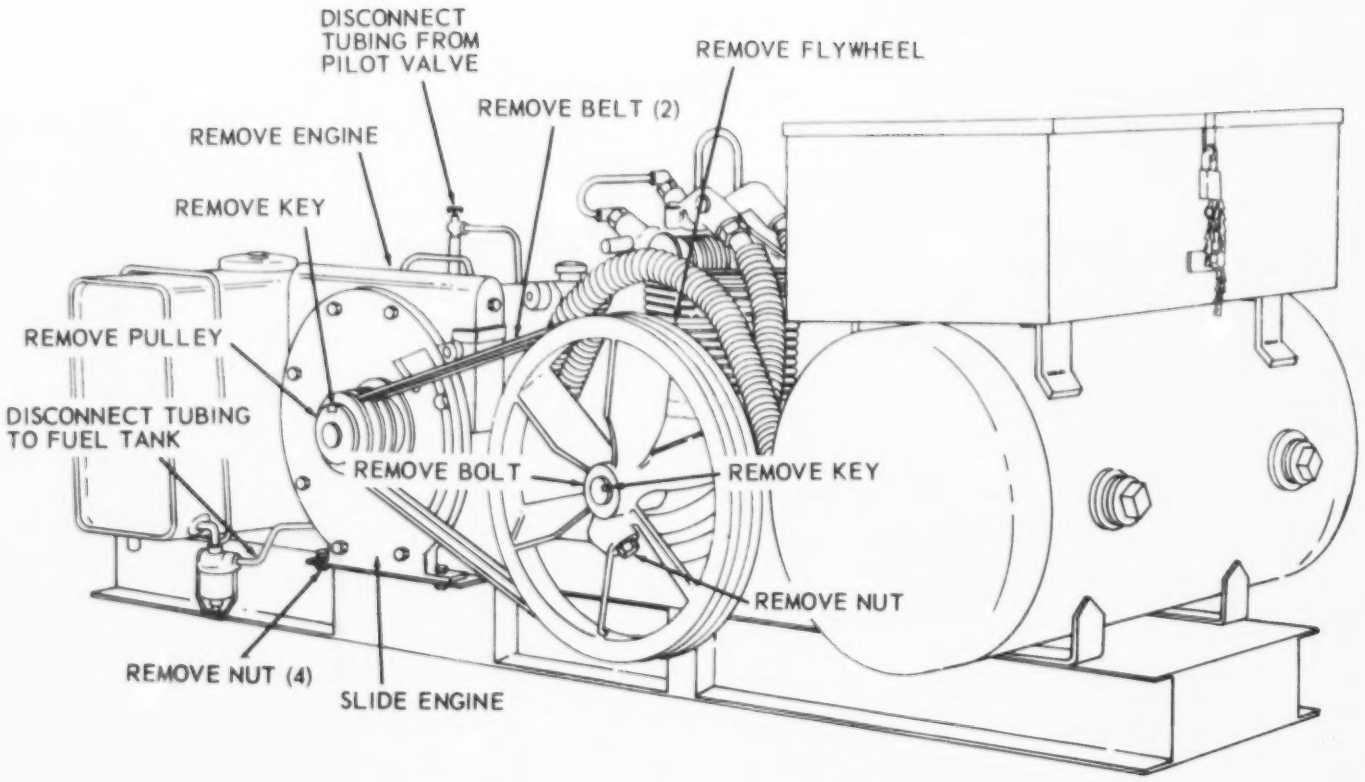


Figure 4-15. V-belts, drive pulley, flywheel, and engine, removal and installation.

b. Cleaning and Inspection.

(1) Clean the V-belts with a clean dry cloth, taking care to remove all dirt, grease, and oil.

(2) Inspect the V-belts for cuts, fraying, and wear.

(3) Replace worn or damaged V-belts.

NOTE

Always replace the V-belts in sets of two.

c. Installation. Install the V-belts as shown in Figure 4-15.

d. Adjustment.

(1) Loosen engine attaching hardware (fig. 4-15). It is not necessary to remove the attaching parts.

(2) Move the engine away from the compressor until there is tension on the V-belts. Press on the V-belts with your fingers about midway between the engine drive pulley and the compressor flywheel. If the depression is more than one-half inch (1.27 cm), readjust tension.

(3) Tighten the engine mounting hardware. Be extremely careful that the engine is square in relation to the mounting base and flywheel to avoid binding and excessive wear of the V-belts.

(4) Install the belt guard.

4-20. Engine Drive Pulley

a. General. The engine drive pulley consists of the pulley, stub shaft, bushing and screws.

b. Removal.

(1) Remove the V-belt set.

(2) Remove the engine drive pulley as illustrated in Figure 4-15.

c. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the drive pulley for cracks, chips, and other damage particularly in V-groove, where excessive wear to the V-belts could occur. Inspect all other parts including threads for damage or wear.

(3) Replace all defective parts.

d. Installation.

(1) Install the drive pulley as shown in figure 4-15.

(2) Install the V-belt set.

Section XI. MAINTENANCE OF COMPRESSOR

4-21. Compressor (MODEL BGR-5M-1)

a. General. On Model BGR-5M-1 air compressor, the gasoline engine, compressor, and air receiver tank are attached to a base assembly which is then mounted to a trailer.

b. Removal.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove slowdown tube from pilot valve to pneumatic cylinder on engine. Remove sensing tube from air receiver to pilot valve and disconnect plumbing and tubing connection to check valve.

(3) Remove belt guard and V-belts.

(4) Remove compressor as illustrated in figure 4-16.

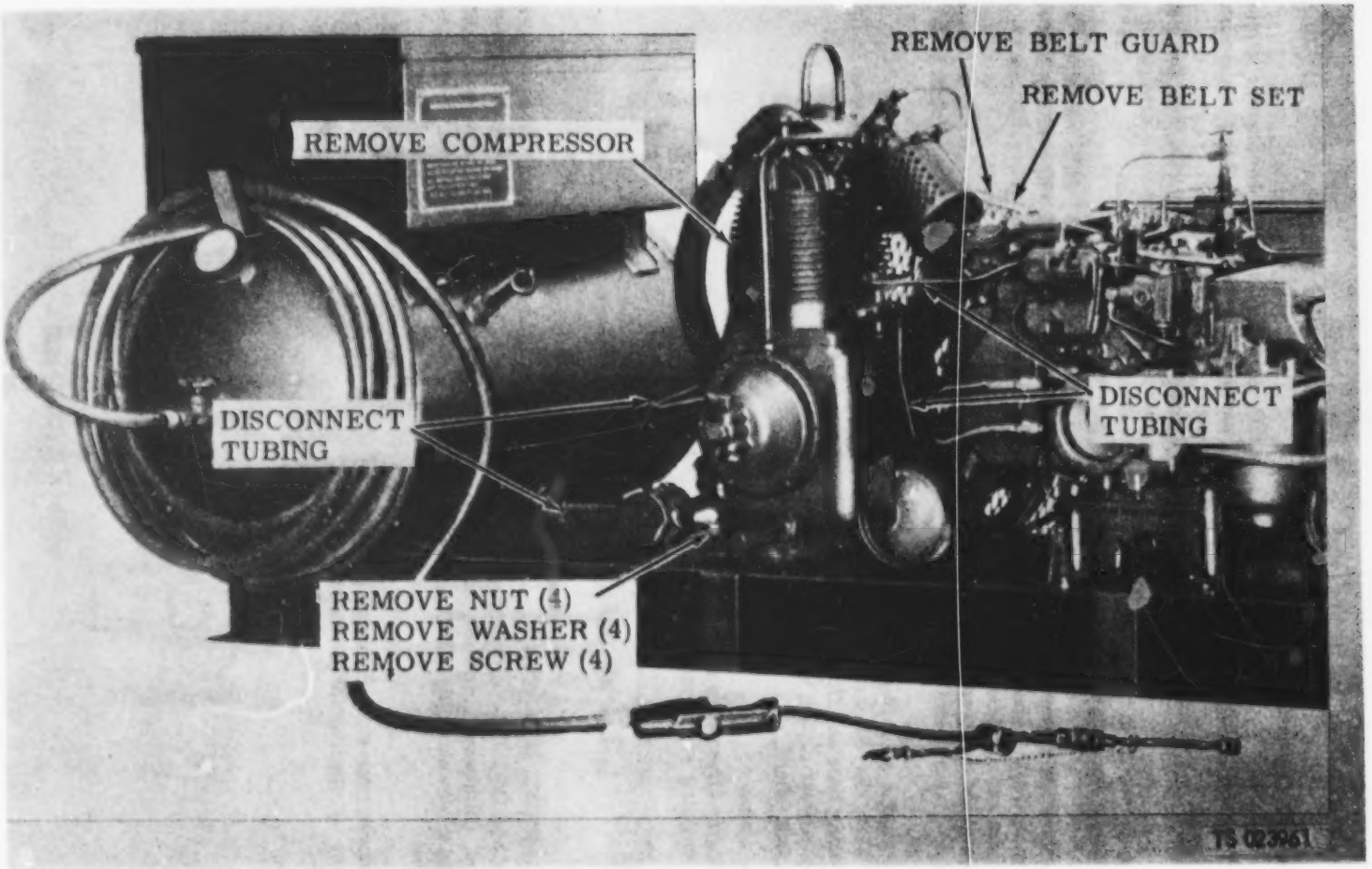


Figure 4-16. Compressor, removal and installation, model BGR-5M-1.

c. Cleaning and Inspection. Clean the compressor with dry compressed air and inspect for damage.

d. Installation.

(1) Install compressor as illustrated in Figure 4-16.

(2) Install V-belts and belt guard. Connect slowdown tube, sensing tube, and check valve connections to compressor.

4-22. Compressor (Model HGR5-8M-1 and Model HGR5-8M-6)

a. Removal.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove slowdown tube from pilot valve. Remove the sensing tube from the bottom of the pilot valve and disconnect plumbing and tubing connections to the check valve.

(3) Remove belt guard and V-belts.

(4) Remove compressor as illustrated in figure 4-17 and 4-17.1, depending on model compressor.

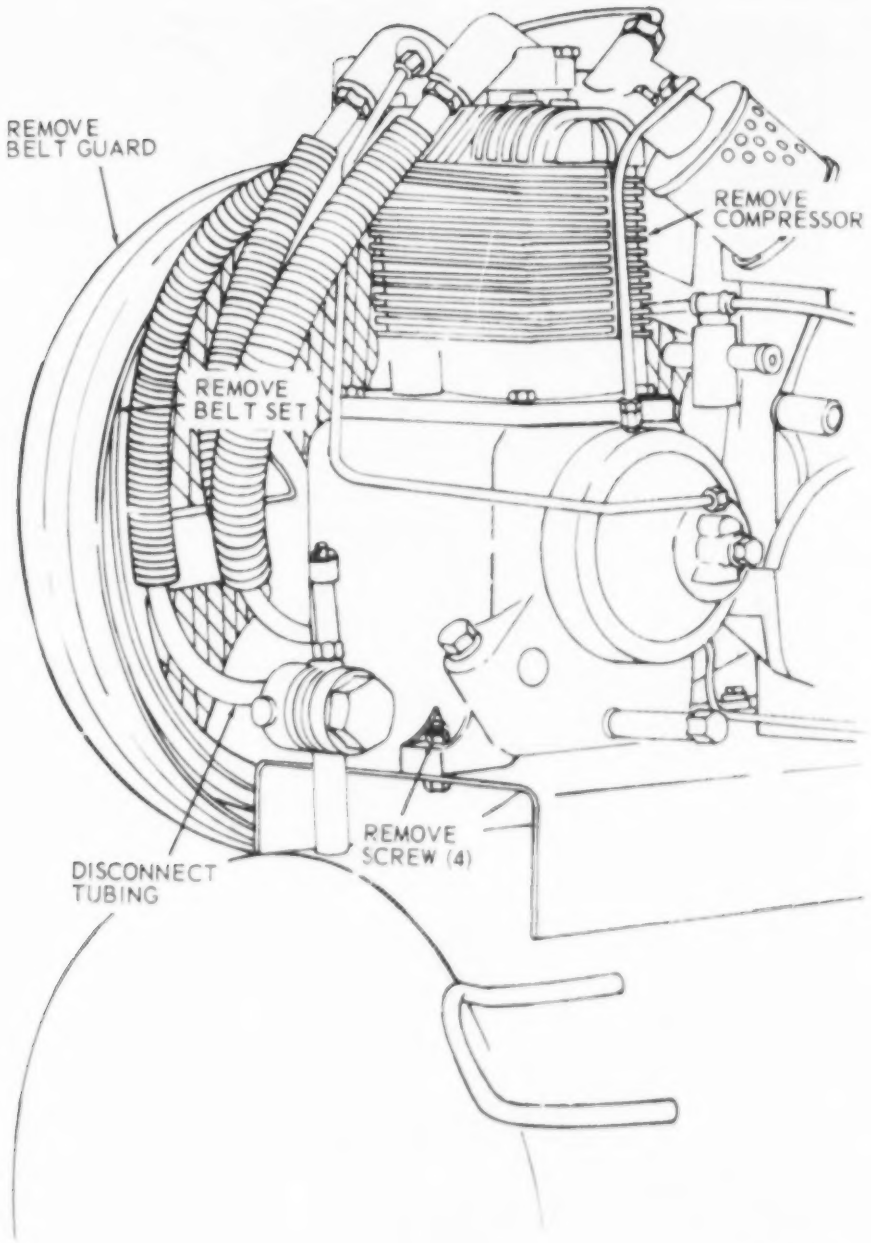


Figure 4-17. Compressor, removal and installation, model HGR5-8M-1.

b. Cleaning and Inspection. Clean with dry compressed air and inspect for damage.

c. Installation.

(1) Install compressor as illustrated in figure 4-17, and figure 4-17.1.

(2) Install V-belts and belt guard. Connect slowdown tube, sensing tube, and check valv connections to compressor.

4-23. Compressor Flywheel

a. Removal.

(1) Remove the V-belt set.

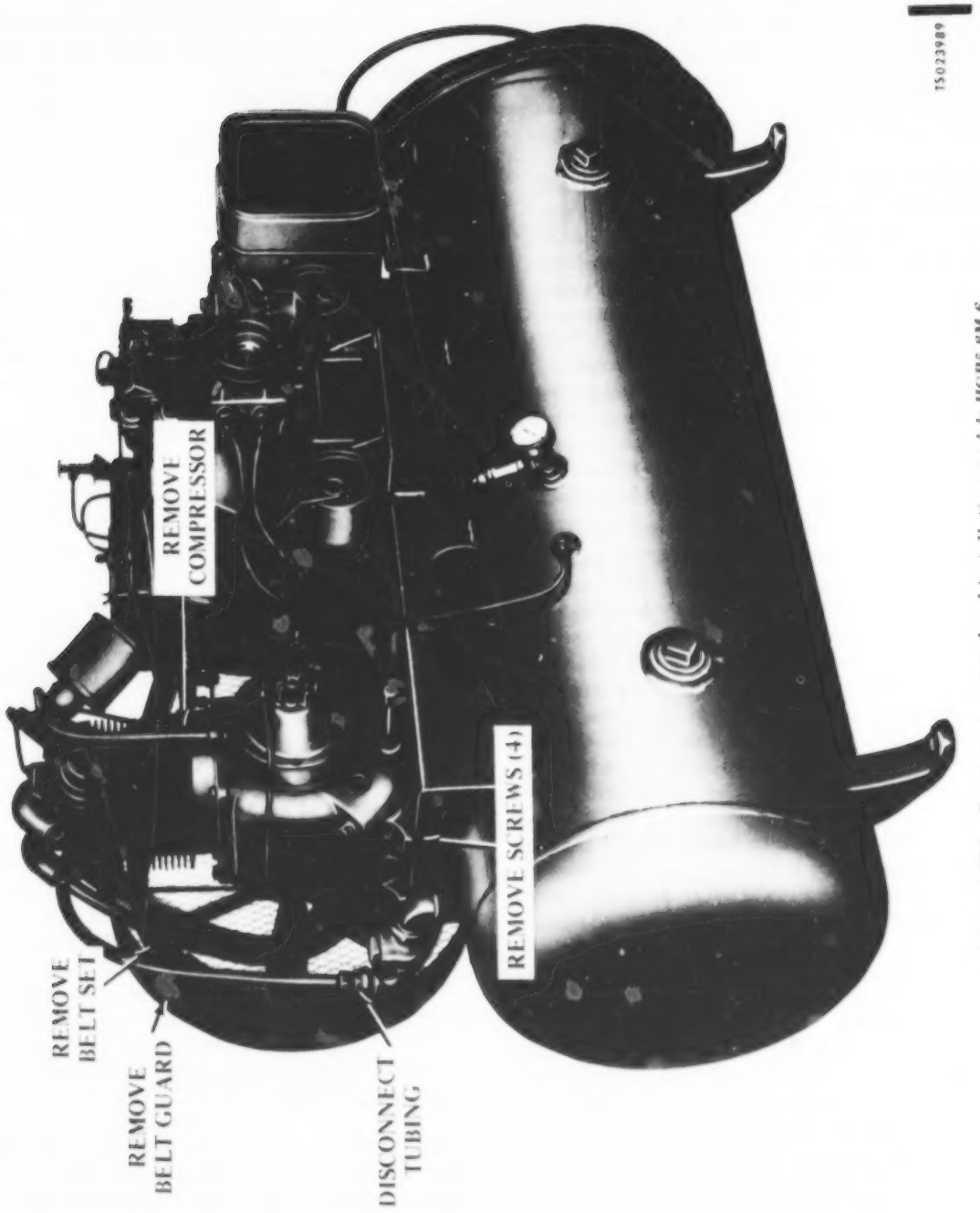


Figure 4-17.1. Compressor, removal and installation, models HGR5-8M-6.

(2) Remove the flywheel as illustrated in figure 4-15.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the flywheel for cracks, chips, distortion and wear. Inspect V-grooves for rough or chipped areas where excessive wear to the V-belts could occur. File off all burrs.

(3) Replace all defective parts.

c. Installation.

(1) Install the flywheel as illustrated in figure 4-15.

(2) Install V-belt set.

4-24. Tube Assemblies

a. General. The tube assemblies include the intercooler and aftercooler tubes, the sensing, breather, and head unloader tubes.

b. Removal.

(1) Stop the engine.

(2) Release the air from the compressor by opening the draincock.

(3) Remove the tube assemblies as illustrated in Figure 4-11.

c. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean the intercooler and aftercooler tubes with a soft bristle brush and cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Clean dirt and dust from between the fins to prevent a buildup which acts as an insulation.

(2) Wipe other tubes with a cloth dampened with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(3) Blow out all tubing with compressed air.

(4) Inspect the tubing for crimps, cracks, and breaks. Straighten bent fins. Inspect threaded parts for thread damage. Replace all unserviceable parts.

d. Installation.

(1) Install the tube assemblies as illustrated in figure 4-11.

(2) Start the air compressor.

(3) Apply soap solution with a brush to all connections and check for air leaks. Leaks will be evidenced by bubbles. Tighten or reinstall leaking parts.

4-25. Interstage Safety Valve

a. Removal. Remove the interstage safety valve as illustrated in Figure 4-11. Do not disassemble the valve.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

Clean the valve with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Inspect valve for damaged threads or other signs of damage. Replace if defective.

c. Installation. Install the interstage safety valve as illustrated in figure 4-11.

4-26. Head Unloaders and Pilot Valve

a. General. The pilot valve senses air receiver tank pressure, and when the pressure is raised to a predetermined setting (approximately 175 psi) (12.3025 kg per sq cm) air is released to the head unloaders. The head unloaders are an intake valve hold open mechanism. When this occurs, the intake valves are held open and the compressor stops compressing air and runs free until the pilot valve senses that the pressure in the tank has dropped to the predetermined setting (approximately 145 psi) (10.1935 kg per sq cm). At this time the air is released from the head unloaders, the intake valves released, and the compressor starts compressing air again. The pilot valve is designed to function as an automatic "on" and "off" air switch. A sensing tube from the air receiver tank to the bottom of the pilot valve allows pressure to act on the bottom of the valve. When pressure is great enough to overcome the spring force holding the valve down on the lower seat, it lifts off the seat and allows air to flow around the valve and out through side ports. One opens to the head unloaders, the other to the pneumatic cylinder and throttle control on the engine. When the valve lifts off the lower seat it moves up and seats on an upper valve seat where it is held by tank pressure. When pressure falls, the valve spring forces the valve back down on the lower seat. Air from the lines to the head unloaders and throttle control escapes through the upper seat in the pilot valve and out a vent hole. The pressure at which the valve is "on" or

"off' is controlled by the spring force. A small adjustment can be made on the spring force by compressing the spring more or less with an adjusting screw provided on the pilot valve.

b. Removal and Disassembly, Head Unloaders.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove the sensing and head unloader tubes from the pilot valve and head unloaders.

(3) Remove the compressor air cleaner, head unloader assemblies and disassemble the head unloaders as follows:

(*a*) Remove the body (1, fig. 4-18) and O-ring (2).

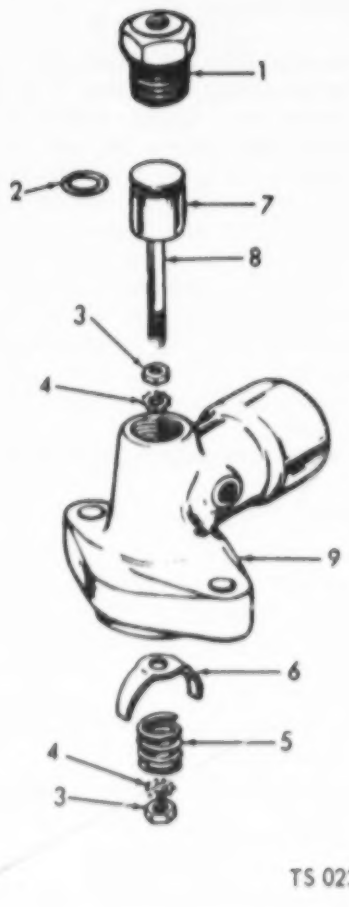
(*b*) Remove the nuts (3) and washers (4).

(*c*) Disengage the spring (5) and remove claw (6), piston (7) and rod (8) from manifold (9).

(*d*) Remove the body (1, fig. 4-19), gasket (2), and O-ring (3).

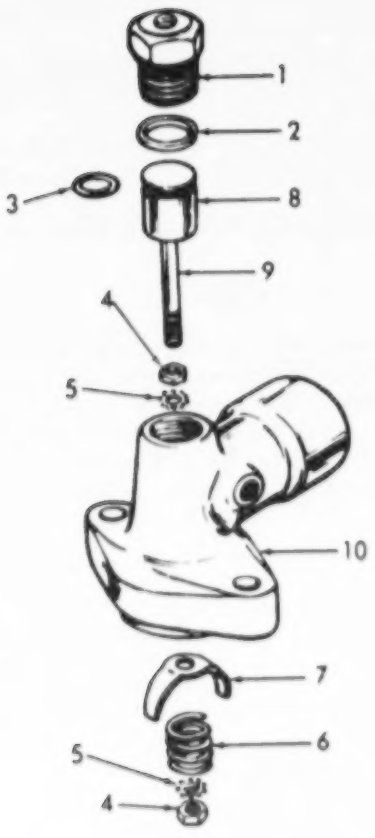
(*e*) Remove the nuts (4) and washers (5) and disengage spring (6).

(*f*) Remove claw (7) and remove piston (8) and rod (9) from manifold (10).



1. Body
2. O-ring
3. Nut
4. Washer (Model HGR5-8M-1, serial numbers 13655 thru 13745)
5. Spring
6. Claw
7. Piston
8. Rod
9. Manifold

Figure 4-18. Head unloader manifold, low pressure intake — exploded view.



1. Body
2. Gasket
3. O-ring
4. Nut
5. Washer (Model HGR5-8M-1, serial numbers 13655 thru 13745)
6. Spring
7. Claw
8. Piston
9. Rod
10. Manifold

Figure 4-19. Head unloader manifold, high pressure intake — exploded view.

c. Cleaning and Inspection, Head Unloaders.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean the head unloader parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect all parts for cracks, breaks, wear, distortion, and other damage. Replace a damaged or defective part.

d. Assembly and Installation, Head Unloaders.

(1) Prior to installation of head unloader in manifold, the actuating fork must be positioned so that it will enter two slots in the compressor intake valve. Reassemble the head unloaders, (*a*) through (*f*), below. Note the position of the slots in the compressor intake valve and rotate the actuating fork to corresponding position. When the head unloader piston is in uppermost position, the fork should protrude 1/16 inch (.16 cm) below the bottom of the manifold.

(*a*) Install the rod (9, fig. 4-19) and piston (8) in the manifold (10); install the claw (7).

(*b*) Install spring (6), washers (5) and nuts (4).

(*c*) Install O-ring (3), position a gasket (2), and install the body (1).

(*d*) Install rod (8, fig. 4-18) and piston (7) in the manifold (9); install claw (6) and spring (5).

(*e*) Install washers (4) and nuts (3).

(*f*) Install O-ring (2) and body (1).

(2) Holding the piston return spring in position on the actuating fork with one finger, place head unloader manifold in position over compressor intake valve. Install screws, drawing up on both sides a little at a time to insure proper entry of manifold into compressor valve well. To check for correct positioning of actuating fork, place blunt instrument in opening at top of cylinder body and push down on piston. If correctly installed, piston will move down and the spring will return it.

(3) Tighten manifold capscrews to 45 ft-lbs (6.22 kgm). Reconnect all tubing.

(4) Start the compressor. When 50 psi (3.5150 kg per sq cm) or more pressure has been developed in the air receiver tank, check manifolds near valve parts and tube connections for leaks with a soap solution. When pressure reaches approximately 175 psi (12.3025 kg per sq cm), the pilot valve should actuate the head unloader and the compressor should run unloaded. When this occurs a distinct difference in sound will be heard and the unloaded air can be felt coming out of compressor air cleaner. Run the compressor in the unloaded condition for 5 to 10 minutes while the tank pressure is observed. Adjustment of the actuating forks must be made if the compressor fails to unload completely.

(5) Bleed the air from the tank down to approximately 145 psi (10.1935 kg per sq cm). The pilot valve should actuate and the compressor should run

loaded. While running loaded, hold hand near air cleaner. Blow back from the air cleaner indicates actuating fork is not allowing the compressor intake valves to seat properly.

e. Removal and Disassembly, Pilot Valve.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove the sensing tube from the bottom of the pilot valve, and disconnect the head unloader and throttle control tubes from the valve. Remove the pilot valve and mounting bracket as shown in Figure 4-11. Disassemble the pilot valve as follows:

(*a*) Remove the locknut (1, fig. 4-20) and collar (2); unscrew adjusting screw (3) and remove spring (4) and stem (5).

(*b*) Remove stud (6) from body (9) and remove sleeve (7) and ball (8).

e.1. Removal and Disassembly, Pilot Valve, (Model HGR5-8M-6).

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove all attaching hardware and disassemble the pilot valve as follows:

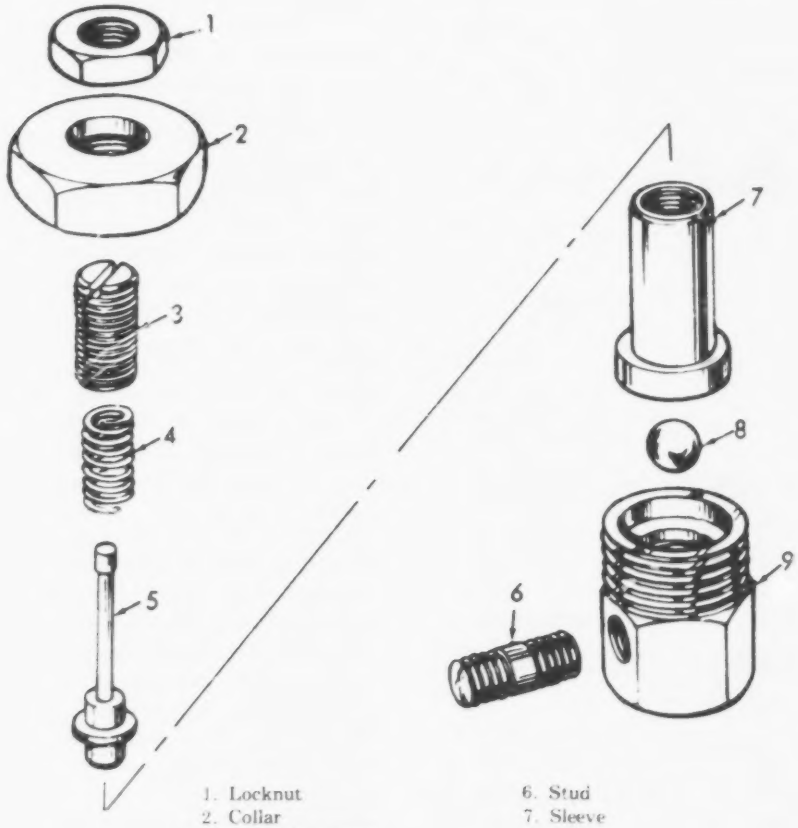
(a) Remove the differential lock nut (1 fig. 4-20.1) securing spring (3), stem (4), piston (5) from main body (2).

(b) Remove pressure adjustment lock nut (6), pressure adjusting nut (7), cap (9), and O-ring (8).

f. Cleaning and Inspection, Pilot Valve.

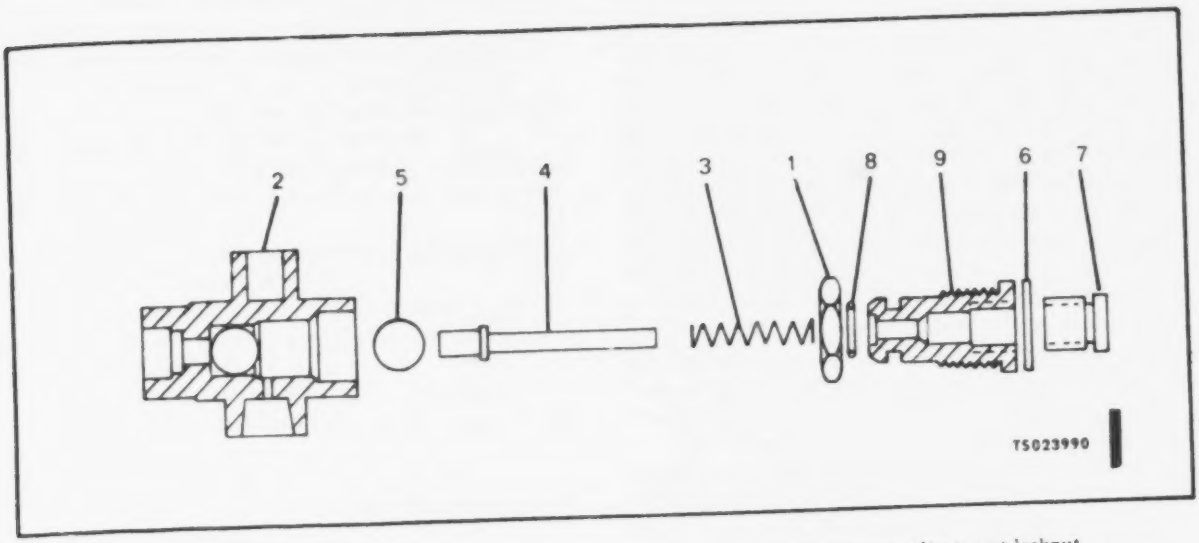
WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) - 138°F. (59°C.).



1. Locknut
2. Collar
3. Adjusting screw
4. Spring
5. Stem
6. Stud
7. Sleeve
8. Ball
9. Body

Figure 4-20. Pilot valve, exploded view.



1. Differential lock nut
2. Main body
3. Spring
4. Stem
5. Piston
6. Pressure adjustment locknut
7. Pressure adjusting nut
8. O-ring
9. Cap

Figure 4-20.1. Pilot valve, exploded view (used on model HGR5 8M-6).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect all parts for cracks, breaks, wear, or damage. Replace a damaged part.

g. Assembly and Installation, Pilot Valve.

(1) Reassemble the pilot valve as follows:

(a) Install the ball (8, fig. 4-20), and sleeve (7) in the body (9); install the stud (6).

(b) Install stem (5), spring (4) and adjusting screw (3); secure with collar (2) and locknut (1).

(2) Install the assembled valve and bracket as illustrated in Figure 4-11.

(3) Reconnect tubing to pilot valve.

g.1. Assembly and Installation, Pilot Valve, (Model HGR5-8M-6).

(1) Reassemble the pilot valve as follows:

(a) Install piston (5, fig. 4-20.1) into main body (2), and stem (4).

(b) Install spring (3) and nut (1).

(c) Install O-ring (8), cap (9), adjustment nut (6), and pressure adjusting nut (7).

(d) Install the assembled valve and bracket as illustrated in Figure 4-11.

h. Adjustment, Pilot Valve.

(1) Start the compressor. Allow compressor to buildup tank pressure to desired cut-out pressure (approximately 175 psi) (12.3025 kg per sq cm). The cut-out pressure may be changed by loosening the locknut (1, fig. 4-20) and turning adjusting screw clockwise to increase pressure and counter- clockwise to decrease pressure.

(2) Bleed off air until pilot valve is actuated noting the tank pressure at this point. It should be approximately 145 psi (10.1935 kg per sq cm).

(3) To adjust differential pressure, unlock nut, turn adjusting barrel counterclockwise to decrease differential. This will lower top pressure. To increase differential, turn barrel clockwise. To change differential on low side, two adjustments are necessary. Unlock nut (1, fig. 4-20), turn adjusting screw counterclockwise. This will also lower top pressure. To adjust top pressure, unlock nut, and turn adjusting barrel, clockwise. Precision setting of differential pressure may require slight adjusting of adjusting screw and/or adjusting barrel.

CAUTION

Never leave adjusting barrel, screwed to bottom position.

(4) When pressure adjustments are completed, tighten all locknuts on the pilot valve. Stop the compressor.

i. Adjustment, Pilot Valve (Model HGR5-8M-6).

(1) Start the compressor. Allow compressor to build up tank pressure. Observe the pressure on pressure gage. When the pilot valve actuates, unloading compressor. This is the "cut-out" pressure and should be approximately 175 psi. To change cut-out pressure, turn pressure adjusting (7, fig. 4-20.1) clockwise to increase pressure, and counter-clockwise to decrease pressure.

(2) Bleed off air from tank until pilot valve is actuated (starting the compressor to pump) observe the tank pressure at this time. It should be approximately 145 psi (10.1935 kg per sq cm). This is the "cut-in" pressure.

(3) To adjust differential pressure (difference between cut-in and cut-out pressure), hold lock-nut (1) closest to the body of the valve so that it does not move, then turn the large nut on the cap (9) very slightly clockwise to increase the differential, and counter-clockwise to decrease it.

(4) When pressure adjustments are complete, tighten all locknuts on pilot valve. Stop the compressor.

4-27. Exhaust Manifolds

a. Removal. Stop the air compressor, and release all air from the compressor by opening the drain-cock. Disconnect tubing from the high pressure and low pressure exhaust manifolds. Remove the exhaust manifolds as illustrated in Figure 4-11.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) - 138°F. (59°C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the manifolds for cracks, breaks, or dents. Inspect all threaded fittings for damaged threads.

(3) Replace all defective parts.

c. Installation. Install the exhaust manifolds as illustrated in Figure 4-11. Reconnect all tubing connections. Tighten manifold capscrews to 45 ft-lbs (6.2 kgm).

4-28. Intake and Exhaust Valves

a. Removal and Disassembly.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove the head unloaders, and the exhaust manifolds.

(3) Remove the disassemble the intake and exhaust valves as follows:

NOTE

When a valve assembly is removed, it should be tagged for identification of cylinder and whether it is an intake or exhaust valve.

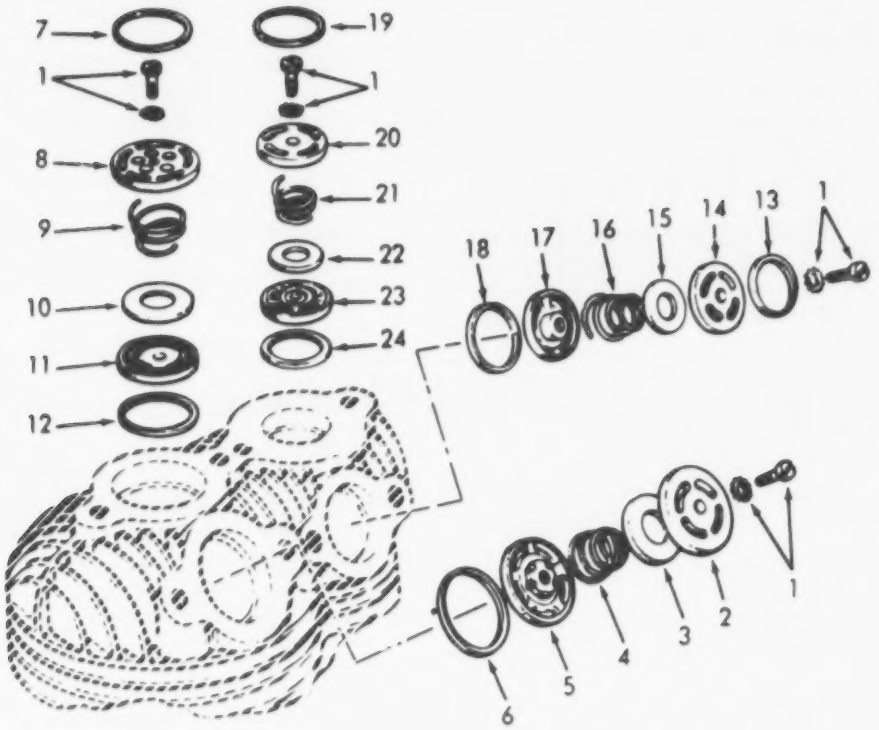
(a) Remove the screw and lockwasher assemblies (1, fig. 4-21) securing valve assembly parts.

(b) Remove the seat (2), disc (3), spring (4), caps (5), and gaskets (6 and 7).

(c) Remove cage (8), spring (9), disc (10), seat (11), and gaskets (12 and 13).

(d) Remove the seat (14), disc (15), spring (16), cage (17), and gaskets (18 and 19).

(e) Remove cage (20), spring (21), disc (22), seat (23), and gasket (24).



TS 023966

1. Screw and lockwasher assembly
2. Intake valve seat
3. Valve disc
4. Valve spring
5. Intake valve cage
6. Valve gasket
7. Valve gasket
8. Exhaust valve cage
9. Valve spring
10. Valve disc
11. Exhaust valve seat
12. Valve gasket
13. Valve gasket
14. Intake valve seat
15. Valve disc
16. Valve spring
17. Intake valve cage
18. Valve gasket
19. Valve gasket
20. Exhaust valve cage
21. Valve disc
22. Valve disc
23. Exhaust valve seat
24. Valve gasket

Figure 4-21. Intake and exhaust valves, exploded view.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect all valve seats and cages for cracks, breaks, rough or scored seats, and mating surfaces. Replace if defective.

(3) Inspect the springs for distortion, weakness, or broken coils. Replace if defective.

(4) Replace all gaskets each time valves are removed or disassembled.

c. Assembly and Installation.

(1) Reassemble and install the intake and exhaust valves as follows:

NOTE

Be sure to replace valve assembly in the same cylinder from which it was removed. Do not mix intake valve with exhaust valves.

(*a*) Install gasket (24, fig. 4-21), seat (23), disc (22), spring (21), and cage (20).

(*b*) Install gaskets (18 and 19), cage (17), spring (16), disc (15), and seat (14).

(*c*) Install gaskets (12 and 13), seat (11), disc (10), spring (9), and cage (8).

(*d*) Install gaskets (6 and 7), cage (5), spring (4), disc (3), and seat (2).

(*e*) Install all four screw and washer assemblies (1).

(2) Install the head unloaders, and reconnect tubing.

(3) Install the exhaust manifolds, and reconnect tubing.

4-29. Centrifugal Unloader

a. Removal and Disassembly. Remove and disassemble as follows:

(1) Remove the muffler assembly (1, fig. 4-22) and disassemble body (2), screen (3), and packing (4).

(2) Remove valve body (5), spring (6), and ball (7).

(3) Remove the six mounting screws (8), loosening cover (11), and remove nut (9) and body (10) from cover; remove cover (11).

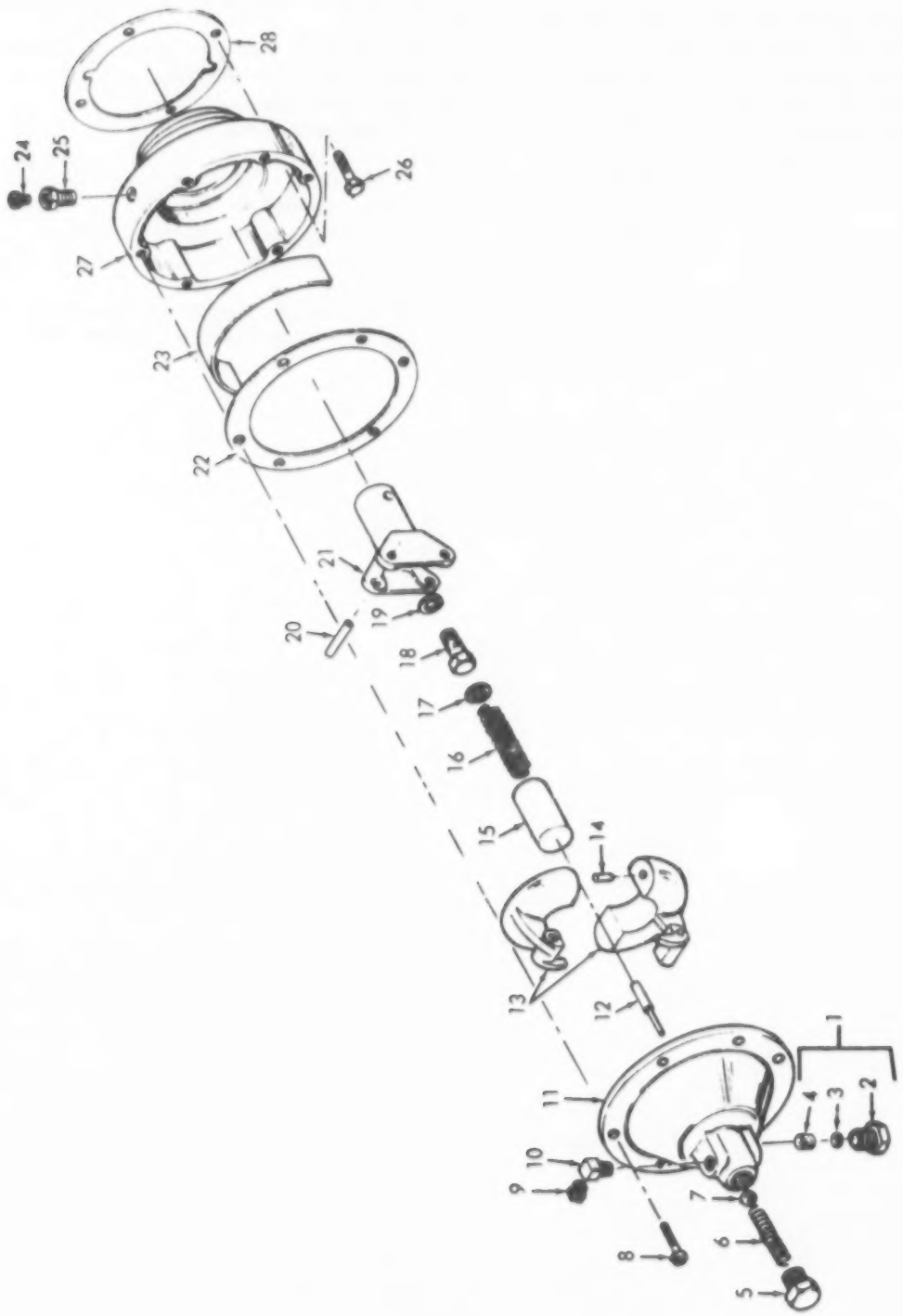
(4) Remove plunger (12), weights (13), and spring (14).

(5) Remove sleeve (15), spring (16), washer (17), screw (18), washer (19), pin (20), and spindle (21).

(6) Remove gasket (22) and baffle plate (23).

(7) Remove nut (24) and body (25) from housing (27).

(8) Remove the four mounting screws (26) and housing (27); remove housing gasket (28).



TS 023967

Figure 4-22. Centrifugal unloader, exploded view.

KEY to Figure 4-22

1. Muffler assembly
2. Muffler body
3. Screen
4. Felt packing
5. Release valve body
6. Release valve spring
7. Ball
8. Screw
9. Compression nut
10. Compression body
11. Governor housing cover
12. Release valve plunger
13. Governor weight
14. Bumper spring
15. Spring sleeve
16. Governor main spring
17. Washer
18.
19. Washer
20. Spring pin
21. Governor spindle
22. Governor cover gasket
23. Baffle plate
24. Compression nut
25. Compression body
26. Screw
27. Governor housing
28. Governor housing gasket set

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use nec. open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the springs for evidence of loss of tension and set. Replace if defective.

(3) Inspect the housing cover, baffle plate, and housing for cracks, breaks, damaged threads, or other damage. Replace if defective.

(4) Inspect the plunger, sleeve, governor pin, spindle and weights, for cracks, nicks, burrs, wear or other damage. Replace all damaged or worn parts.

(5) Inspect all hardware for breaks, distortion, or damaged threads. Replace all damaged hardware.

(6) Discard and replace all gaskets.

c. Assembly and Installation.

(1) Carefully install the housing (27, fig. 4-22). Leave out the housing gaskets (28), at this time. Attach the housing to the crankcase with one screw (26) at the top and one screw at the bottom. Be sure that the main bearing assembly on the end of the crankshaft fits properly in the housing. Set the two attaching screws fingertight. Now, use feeler gage and measure the gap between housing and crankcase at top and bottom. Average the two dimensions and add .005 inch (.01 cm). This will determine the selection of housing gaskets to use. A combination of gasket should equal the total determined above. Proper adherence to this procedure will minimize crankshaft end play.

(2) Remove housing from crankcase and install housing gaskets as determined above. Install housing and secure with attaching screws. Tighten screws to 25 ft-lbs (3.4 kgm).

(3) Install the body (25) and nut (24) in housing (27).

(4) Install baffle plate (23) and gasket (22).

(5) Install spindle (21), pin (20), washer (19), screw (18), washer (17), spring (16), and sleeve (15).

(6) Install spring (14), weight (13), and plunger (12).

(7) Position the cover (11) on the housing and install mounting screws (8); install body (10) and nut (9) on housing (11).

(8) Install ball (7), spring (6), and valve body (5).

(9) Assemble muffler assembly (1) by installing packing (4), screen (3), and body (2).

4-30. Handhole Plate and Gasket (Model HGR5-8M-1 only)

a. Removal.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Drain oil from crankcase by removing oil drain plug.

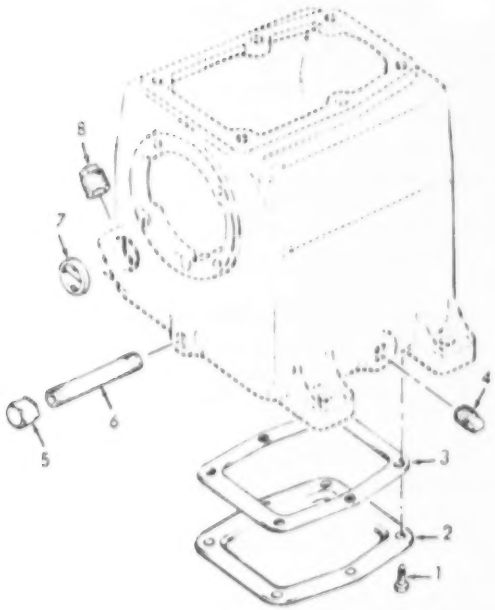
(3) Remove handhole plate and gasket as follows:

(a) Remove the mounting capscrews (1, fig. 4-23) and remove the handhole plate (2) and gasket (3).

(b) Remove the plug (4).

(c) Remove cap (5) and nipple (6).

(d) Remove gage (7) and plug (8).



TS 023968

1. Capscrew
2. Handhole plate
3. Gasket
4. Plug
5. Cap
6. Nipple
7. Gage
8. Plug

Figure 4-23. Handhole plate, removal and installation.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

(1) Clean handhole plate with cleaning solv Federal Specification P-D-680, and dry thoroug

(2) Inspect for cracks, breaks, and de Straighten out minor dents. Replace if defecti

(3) Discard handhole plate gasket and rep with a new gasket.

c. Installation.

(1) Install the handhole plate (2, fig. 4-23) new gasket (3) with its attaching screws (1). Tig screws to 25 ft-lbs (3.4 kgm).

(2) Install plugs (4 and 8).

(3) Install gage (7), nipple (6), and cap (5).

Section XII. MAINTENANCE OF COMPRESSOR CONTROLS, INSTRUMENTS, AND RELATED PARTS

4-31. Safety Valve

a. Removal.

(1) Stop air compressor, and release all air from the air receiver by opening the draincock.

(2) Remove the safety valve (1, fig. 4-24 or 4-25).

KEY to Figure 4-24.
1. Safety valve
2. Pressure gage
3. Globe valve
4. Nipple
5. Hose assembly
6. Inflator gage
7. Draincock

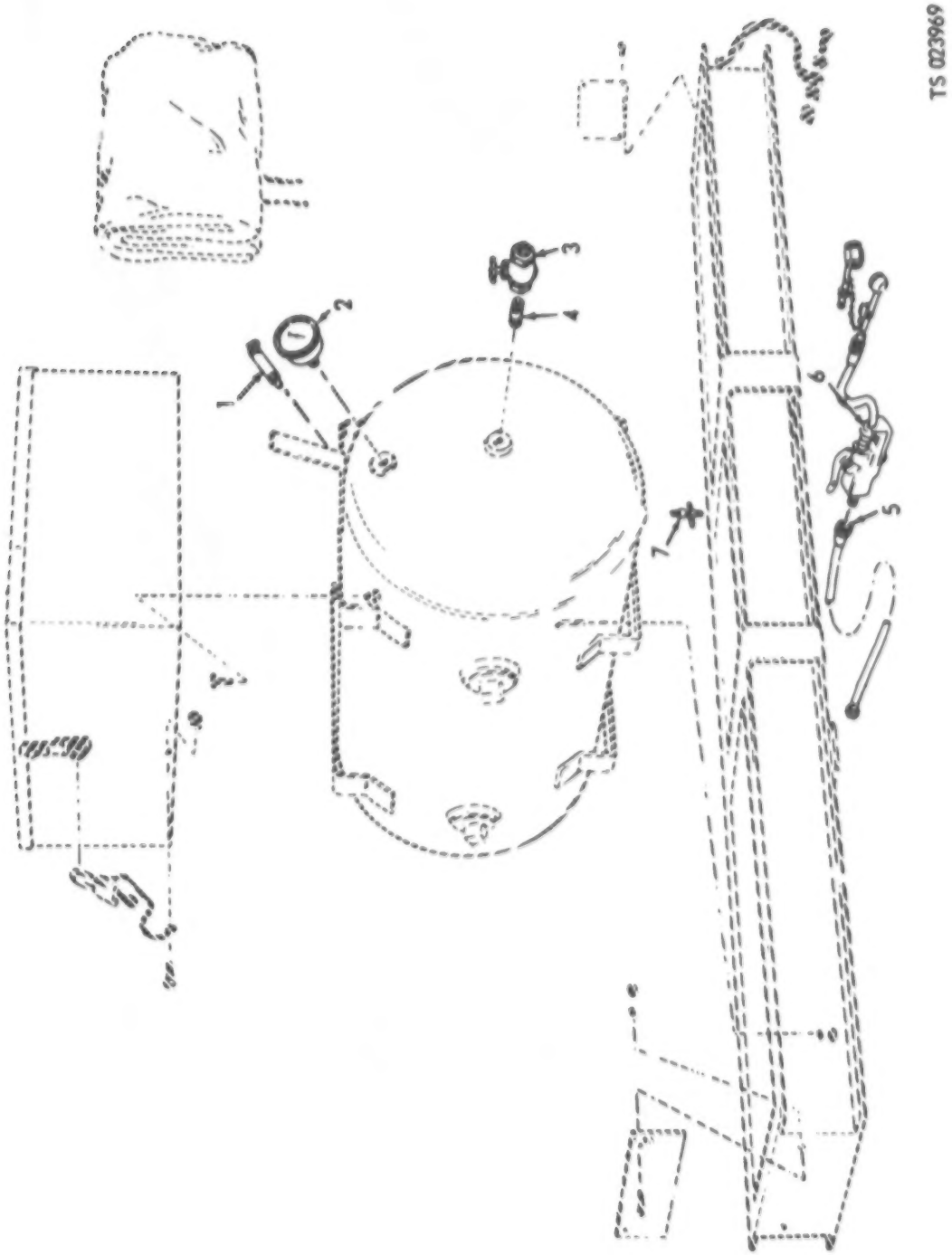
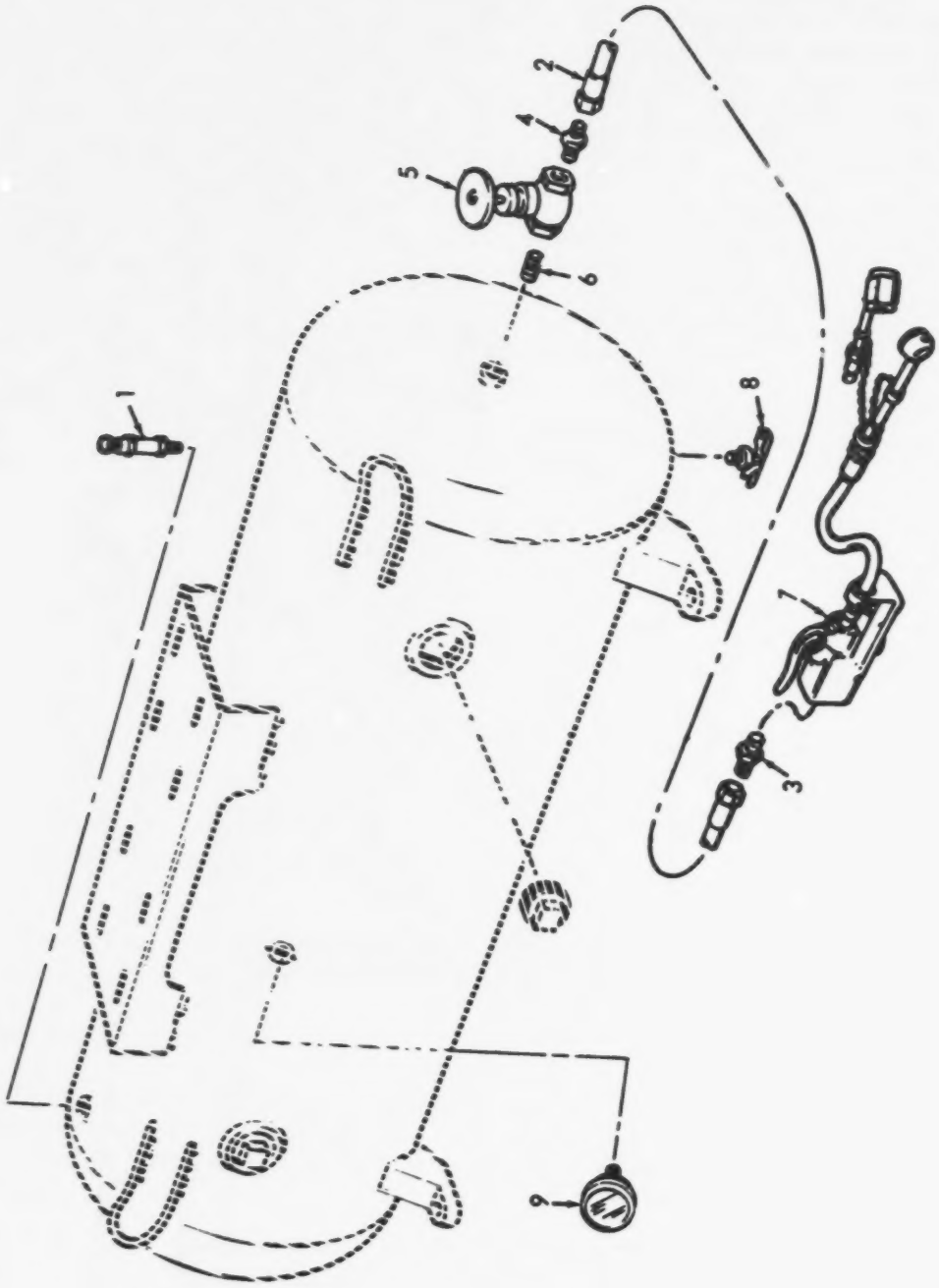


Figure 4-24. Compressor controls and instruments, model BGR-5M-1, exploded view.



TS 023970

Figure 4-25. Compressor controls and instruments, model HGR5-8M-1, exploded view.

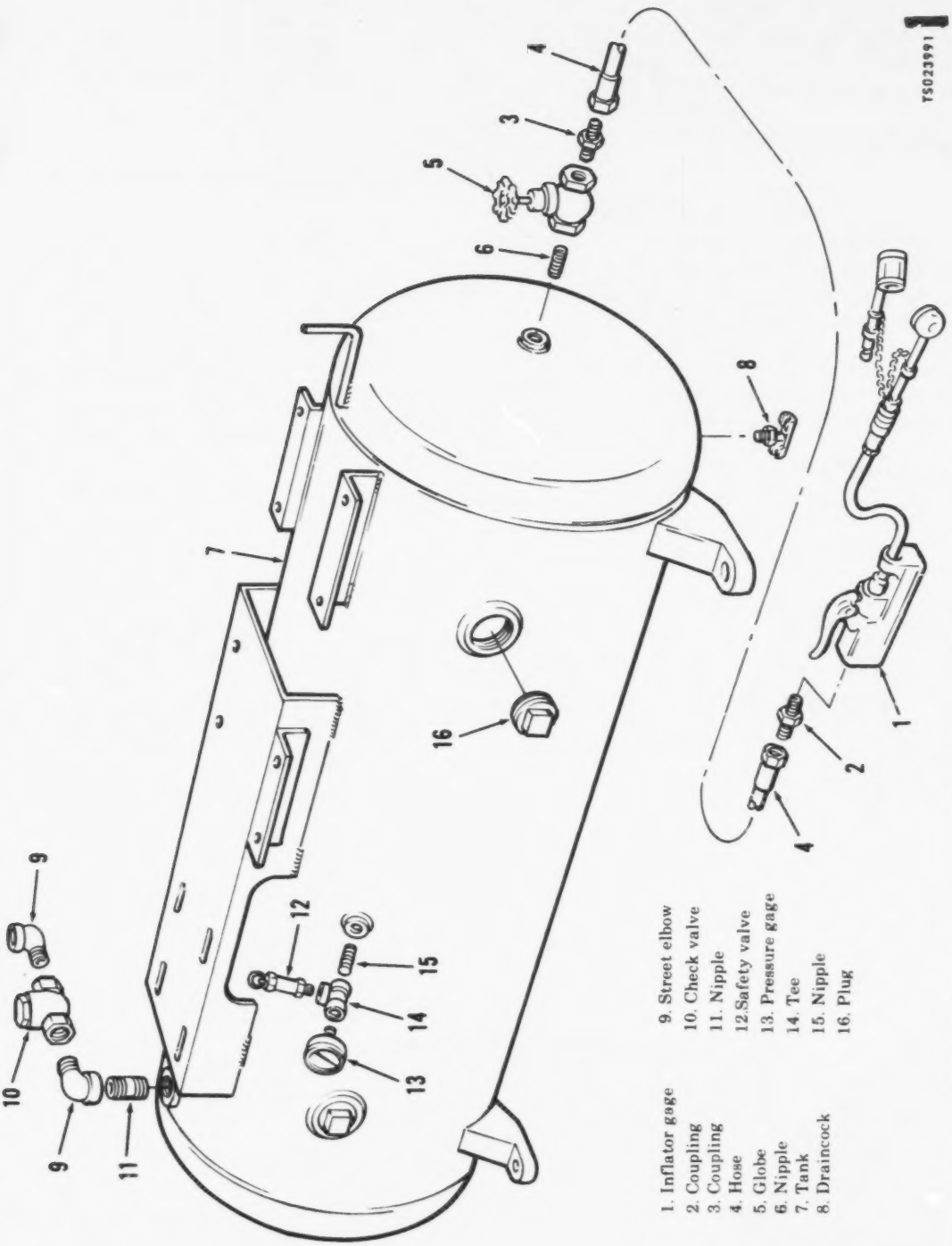


Figure 4-25.1. Compressor controls and instruments, air receiver tank and related parts, model HGR5-8M-6, exploded view.

best copy available

Reproduced from poor document.

KEY to Figure 4-25.

1. Safety valve
2. Hose
3. Coupling
4. Coupling
5. Globe valve
6. Nipple
7. Inflator gage
8. Draincock
9. Pressure gage

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) - 138°F. (59°C.).

(1) Clean valve with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect valve for cracks, breaks, damaged threads, or other damage. Replace safety valve if damaged or defective. The safety valve has been preset (200 psi) (14.1 kg per sq cm) and should not be disassembled.

c. Installation. Install the safety valve (1, fig. 4-24 or 4-25).

4-32. Check Valve

a. Removal and Disassembly.

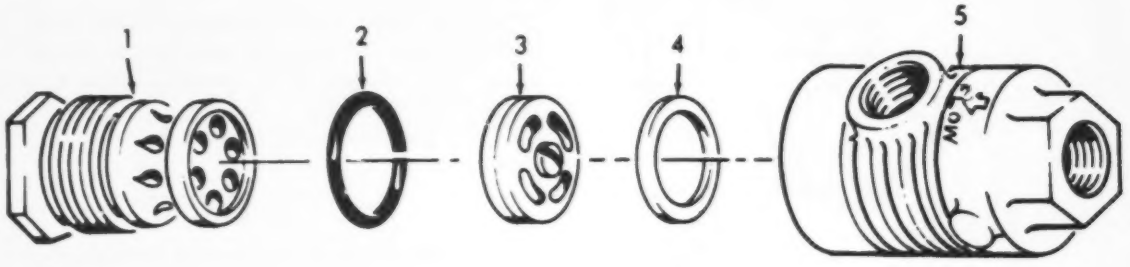
(1) Stop air compressor, and release all air from the compressor by opening the draincock.

(2) Disassemble the check valve as follows:

(a) Remove plug (1, fig. 4-26), O-ring (2), valve assembly (3), and gasket (4) from body (5).

(b) Remove the cap (1, fig. 4-27), ping (2), spring (3), disc (4), seat (5), and guide (6) from body (7).

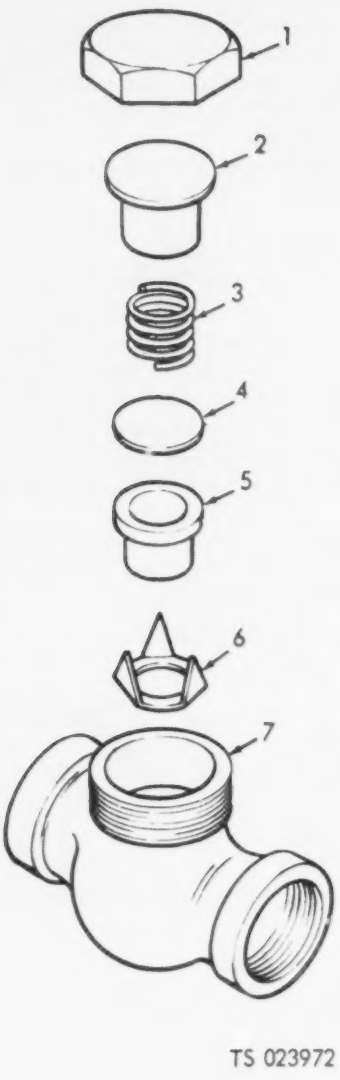
a.1. Remove cap (1, fig. 4-26.1) gasket (2), spring (3), disc (4), set (5), guide (6) from the body (7). (Model HGR5-8M-6).



TS 023971

1. Plug
2. O-ring
3. Valve assembly
4. Gasket
5. Body

Figure 4-26. Check valve, exploded view.



1. Cap
2. Ping
3. Spring
4. Disc
5. Seat
6. Guide
7. Body

Figure 4-27. Check valve, exploded view (model HGR58M-1, serial numbers 13655 through 13745).

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.)-138°F. (59°C.).

(1) Clean the parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect valve parts for cracks, breaks, damaged threads, wear or other damage. Replace worn or defective parts.

c. Assembly and Installation. Reassemble and install the check valve as follows:

(1) Install guide (6, fig. 4-27), seat (5), disc (4), spring (3), ping (2), and cap (1) on body (7).

(2) Install gasket (4 fig. 4-26), valve assembly (3), O-ring (2), and plug (1) on body (5).

d.1. For model (HGR5-8M-6) install the pressure gage (2, fig. 4-24,9, fig. 4-25, or 13, fig. 4-25.1).

4-33. Pressure Gage

a. Removal.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove the pressure gage (2, fig. 4-24, 9, fig. 4-25, or 13, fig. 4-25.1).

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) - 138°F. (59°C.).

Clean gage with a cloth dampened with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Check for cracks, dents, breaks, or other damage. Replace gage if damaged or broken.

c. Installation. Install the pressure gage (2, fig. 4-24, 9, fig. 4-25, 13, fig. 4-25.1).

4-34. Globe Valve and Inflator Gage

a. Removal and Disassembly.

(1) Stop the air compressor, and release all air from the air receiver by opening the draincock.

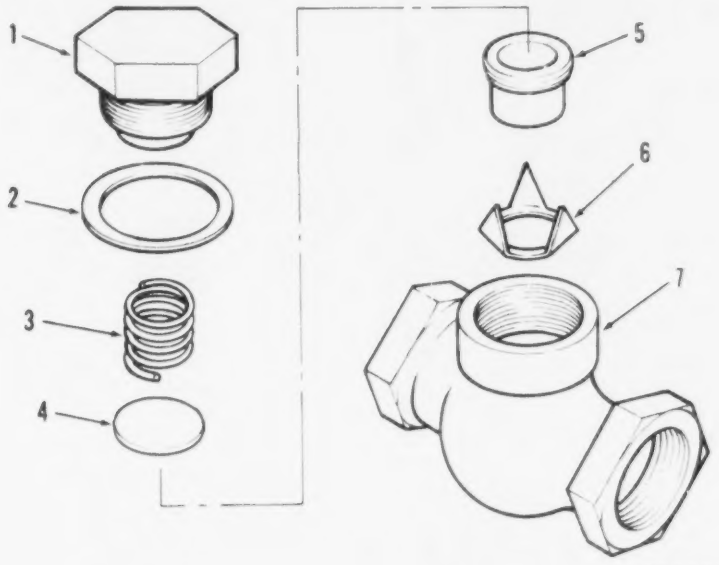
(2) Remove the air hose assembly (2, fig. 4-24) from the globe valve if attached. Remove the globe valve (3, fig. 4-24 or 5, fig. 4-25) from the air receiver.

(3) Disassemble the globe valve as follows:

(a) Remove the screw (1, fig. 4-28) securing the handle, and remove handle (2).

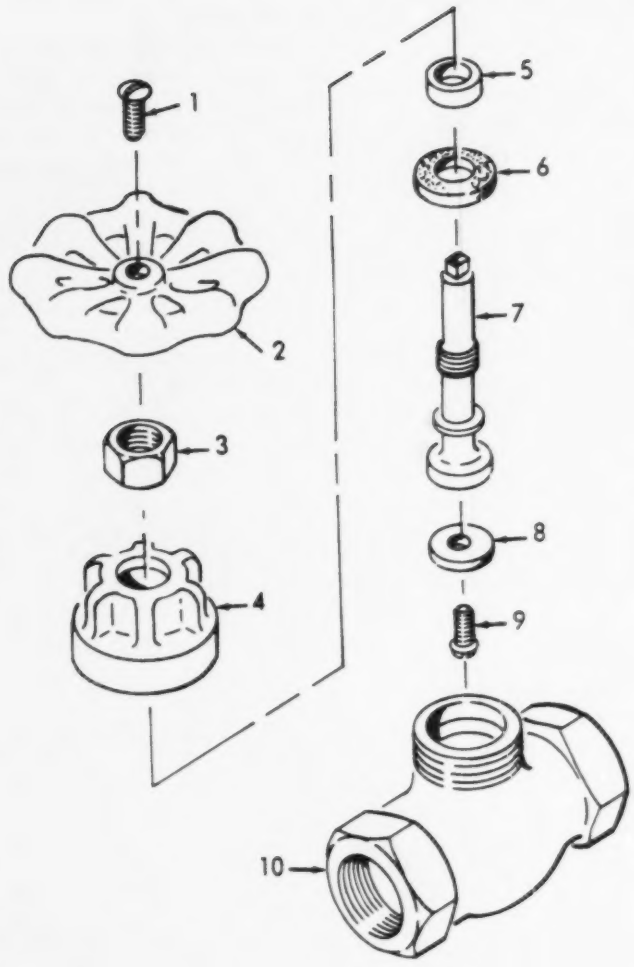
(b) Remove the nut (3), bonnet (4), packing (5), washer (6), stem (7), washer (8), and screw (9) from the body (10).

(4) Remove the inflator gage (6, fig. 4-24 or 7, fig. 4-25).



1. Plug
2. O-ring
3. Valve assembly
4. Gasket
5. Body

Figure 4-27.1. Check valve, exploded view.



TS 023973

1. Screw
2. Handle
3. Bonnet nut
4. Bonnet
5. Packing
6. Washer
7. Stem
8. Washer
9. Screw
10. Body

Figure 4-28. Globe valve, exploded view.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Inspect parts for cracks, dents, breaks, or other damage. Replace defective parts.

c. Assembly and Installation.

(1) Assemble globe valve by installing screw (9, fig. 4-28), washer (8), stem (7), washer (6), packing (5), bonnet (4) and nut (3) to body (10).

(2) Insert handle (2) and secure with screw (1).

(3) Install globe valve (3, fig. 4-24 or 5, fig. 4-25). Install hose assembly (2, fig. 4-25).

(4) Install the inflator gage (6, fig. 4-24 or 7, fig. 4-25).

4-35. Oil Level Gage

a. Removal.

(1) Stop the air compressor, and drain all air from the compressor by opening the draincock.

(2) Drain oil from crankcase by removing oil drain plug.

(3) Remove the oil level sight gage (7, fig. 4-23) from the crankcase.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

Clean the oil level gage with cleaning solvent, Federal Specification P-D-680, and dry thoroughly. Inspect the gage for breaks, cracks, or damaged threads. Inspect the glass for marks, breaks or cloudiness that might impair visual observation of oil level within the crankcase. Replace gage if damaged or defective.

c. Installation.

(1) Install oil level gage (7, fig. 4-23) in crankcase.

(2) Install oil drain plug and service in accordance with the lubrication order

4-36. Draincock

a. Removal.

(1) Stop the air compressor, and release all air from the air receiver by opening the draincock. If draincock is not operative, close globe valve on the air receiver and remove hose assembly. Then open globe valve and allow air to drain from the air receiver.

(2) Remove the draincock (7, fig. 4-24, 8, fig. 4-25 and 8, fig. 4-25.1) from the bottom of the air receiver tank.

b. Cleaning and Inspection.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) — 138°F. (59°C.).

Clean the draincock with cleaning solvent Federal Specification P-D-680, and dry thoroughly. Open and close stem of draincock a number of times washing thoroughly to remove any dirt or foreign matter. Blow dry with compressed air. Inspect for damaged threads, dents, cracks, or breaks. Replace if damaged.

c. Installation. Install draincock (7, fig. 4-24, 8, fig. 4-25, and 4-25.1), in air receiver tank.

Section XIII. MAINTENANCE OF AIR RECEIVER

4-37. Air Receiver

a. Removal.

(1) Stop the air compressor, and release all air from the air receiver by opening the draincock.

(2) Remove all tubing and plumbing connections to the tank, and remove the air receiver tank as illustrated in Figure 4-29.

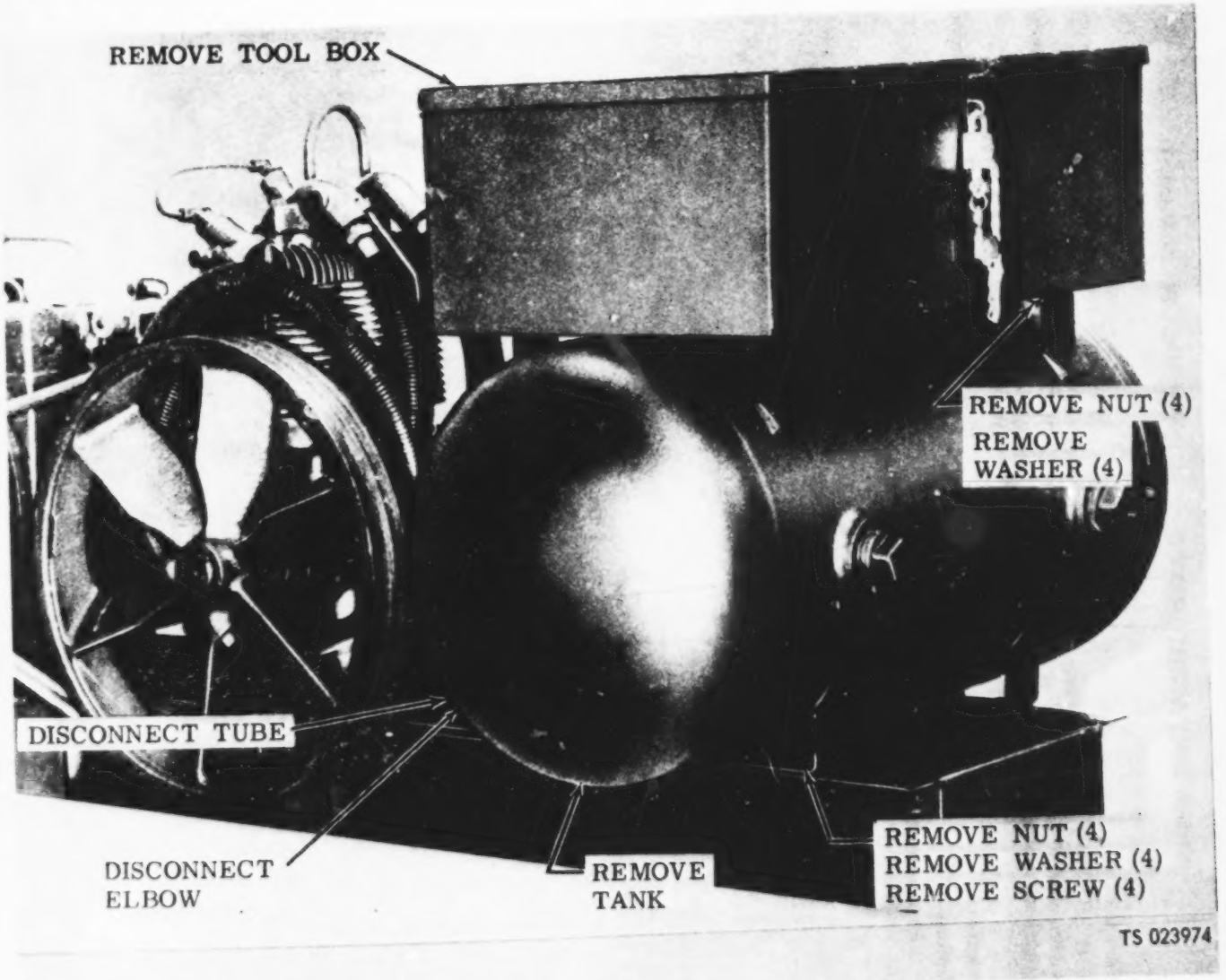


Figure 4-29. Air receiver, removal and installation.

b. Cleaning, Inspection and Repair.

(1) Clean items with dry compressed air and inspect for damage.

(2) Replace a damaged air receiver.

c. Installation. Install the air receiver tank illustrated in Figure 4-29, and reconnect all tub and plumbing to the tank.

Section XIV. MAINTENANCE OF ENGINE (MODEL BGR-5M-1)

4-38. General

On Model BGR-5M-1 air compressor, the gasoline engine, compressor, and air receiver tank are attached to a base assembly which is then mounted to a trailer.

4-39. Engine

a. Removal.

(1) Stop the air compressor, and release all air from the compressor by opening the draincock.

(2) Remove fuel line connections to the eng after first draining the fuel tank.

(3) Disconnect slowdown tube connection pneumatic cylinder mounted to engine.

(4) Remove belt guard and V-belts.

(5) Remove gasoline engine as illustrated figure 4-30.

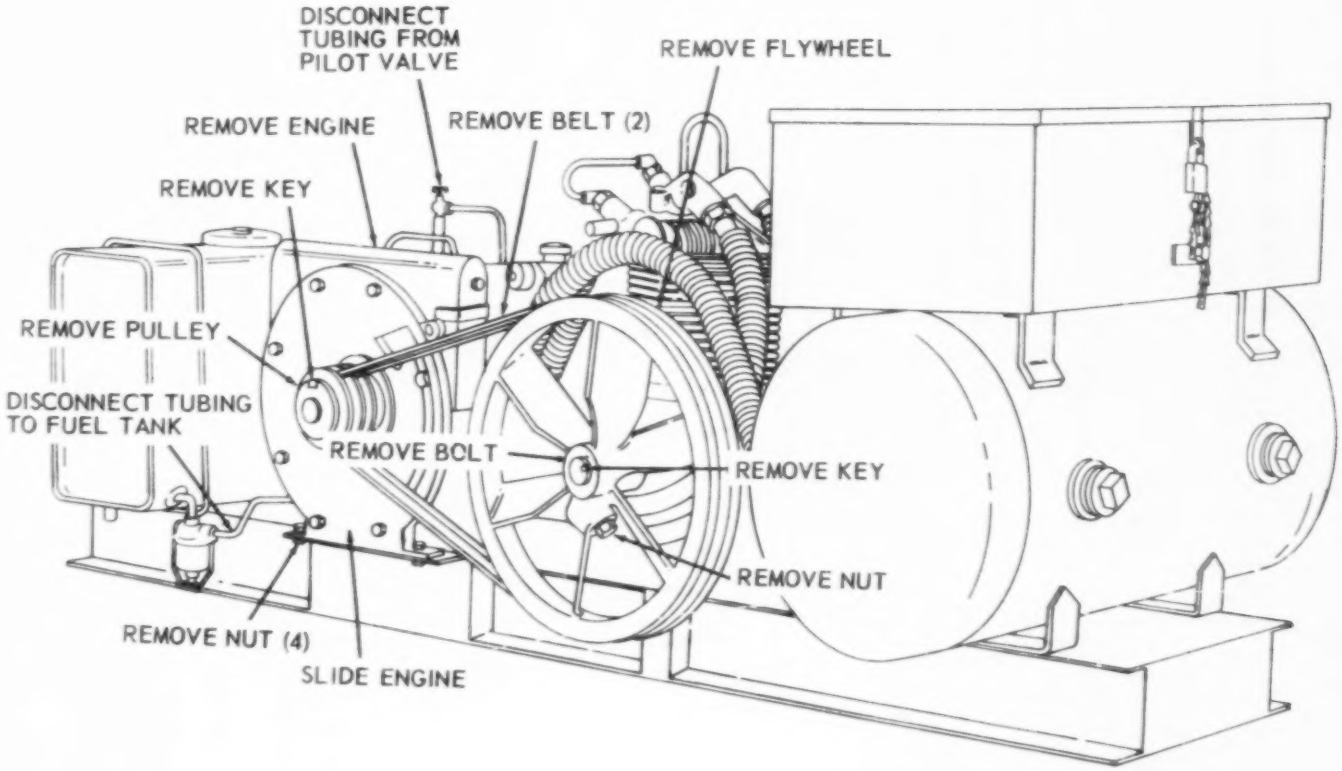


Figure 4-30. V-belts, drive pulley, flywheel, and engine, removal and installation.

b. Cleaning and Inspection. Clean the engine with dry compressed air and inspect for damage.

c. Installation.

(1) Install engine as illustrated in figure 4-30.

(2) Install V-belts and belt guard. Co fuel line to engine and slowdown tube to th controls. Service the air compressor in accord with daily preventive maintenance services.

Section XV. MAINTENANCE OF ENGINE (MODEL HGR5-8M-1 AND HGR5-8M-6)

4-40. General

On Model HGR5-8M-1 and HGR5-8M-6 air compressor, the gasoline engine and compressor are attached to a platform on top of the air receiver. The platform is welded to the air receiver tank.

4-41. Engine

a. Removal.

(1) Stop the air compressor, and release all air from the air receiver and compressor by ope draincock.

(2) Disconnect fuel line connection at the gine after first draining the fuel tank.

(3) Disconnect slowdown tube connectio the pneumatic cylinder mounted on the engine

(4) Remove belt guard and V-belts.

(5) Remove gasoline engine as illustrate figure 4-31, and 4-31.1 depending on m compressor.

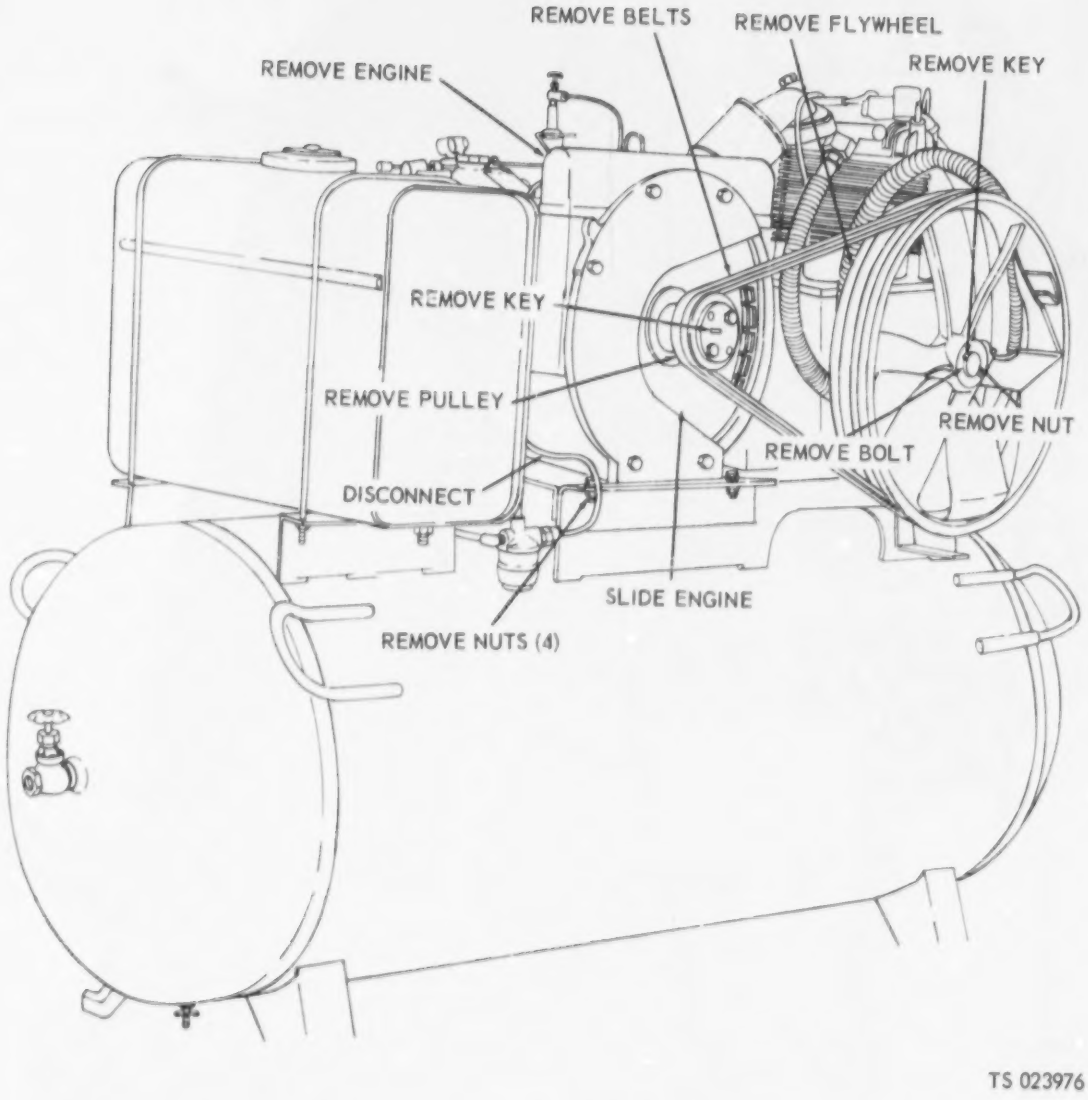


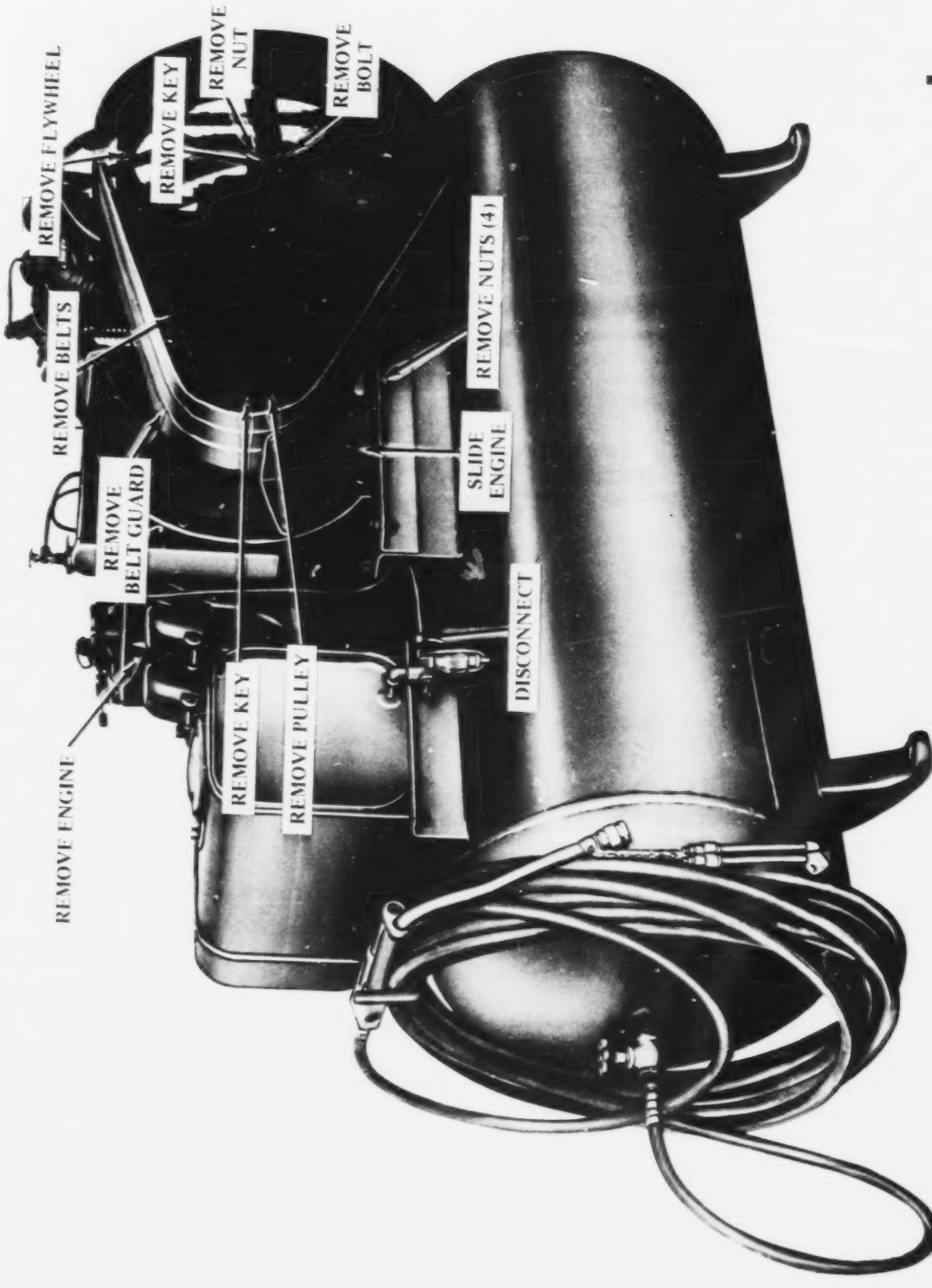
Figure 4-31. Engine removal and installation, model HGR5-8M-1.

b. Cleaning and Inspection. Clean with dry compressed air and inspect for damage.

c. Installation.

(1) Install the engine as illustrated in figure 4-31, and figure 4-31.1, depending on model compressor.

(2) Install V-belts and belt guard. Connect fuel line to engine and slowdown tube to throttle controls. Service the air compressor in accordance with daily preventive maintenance services.


REMOVE FLYWHEEL
REMOVE BELTS
REMOVE BELT GUARD
REMOVE ENGINE
REMOVE KEY
REMOVE NUT
REMOVE BOLT
REMOVE NUTS (4)
SLIDE ENGINE
DISCONNECT
REMOVE KEY
REMOVE PULLEY

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

5-1. Special Tools and Equipment

No special tools or equipment are required to perform direct and general support maintenance on the compressor.

5-2. Maintenance Repair Parts

Direct and general support maintenance repair parts for the air compressor are listed and illustrated in TM 5-4310-277-25P.

Section II. TROUBLESHOOTING

5-3. General

a. This section contains troubleshooting information locating and correcting most of the troubles which may develop in the air compressor unit(s). Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help to determine probable causes and corrective action to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions notify your supervisor.

5-4. Direct Support and General Support Maintenance Troubleshooting

Refer to Table 5-1 for troubleshooting pertaining to direct support and general support maintenance.

Table 5-1. Troubleshooting

Malfunction Test or Inspection Corrective Action
COMPRESSOR FAILS TO PUMP TO PRESSURE
Step 1. Inspect the pistons, rings, and connecting rods for damage. Remove the compressor, belt guard, V-belts, compressor flywheel, tube assemblies and manifolds. Remove the handhole plate. Disconnect the connecting rods from the crankshaft by removing the connecting rod bolt (1, fig. 6-6) and connecting rod cap (2). Remove the cylinder block (5) with pistons and connecting rods in it, from the crankcase. Pull the assembled pistons and connecting rods from the cylinder block. Remove the retaining ring (6, fig. 6-6) and piston pins (7). Remove ring sets (9 and 11). Remove bearings (12) and rods (13) from crankcase (14). Inspect connecting rods for cracks and breaks. Place the piston rings in the cylinder bore in which they will be used and measure the ring gap with a feeler gage. Position the piston ring square with the cylinder bore about one half inch (1.27 cm) from the top. The correct gap for the small compression and oil rings is 0.0012 (.003 cm) plus or minus 0.005 inch (.01 cm). Measure the ring groove in the pistons for wear and side clearance, using a feeler gage between the ring and groove side wall. The desired ring groove clearance is 0.0010 (.003 cm) to 0.0025 inch (.006 cm) for the low-pressure rings and 0.0010 (.003 cm) to 0.0045 inch (.01 cm) for the high-pressure rings. Measure the clearance of the piston pin in the piston pin bushing. Desired clearance is 0.002 (.0005 cm) and 0.0009 inch (.002 cm). Maximum allowable wear of piston pin diameter is 0.001 inch (.003 cm).
Replace or repair damaged items. Realine slightly twisted rods. If the ring gap is less than the specified width, file across the butt ends of the ring to increase the gap to the required tolerance. If the ring gap is greater than 0.023 inch (.06 cm) for any ring, replace the entire set of rings. Reassemble the piston and connecting rods using new parts where necessary. Install the assembled pistons and connecting rods into the cylinder block. Install the cylinder block assembly to the crankcase. Tighten the cylinder block screws to 45 foot-pounds (6.2 kgm) torque. Attach connecting rods to crankshaft and secure with connecting rod cap (2, fig. 6-6) and connecting rod bolt (1). Tighten bolt to 25 foot-pounds (3.5 kgm) maximum. The connecting rod cap

Figure 4-31.1. Engine removal and installation, model HGR5-8M-6.

Malfunction
Test or Inspection
Corrective Action

and connecting rod are matched parts and should not be interchanged. Install the intake and exhaust
Install the exhaust manifolds, head unloaders, interstage safety valve and tube assemblies. Inst
handhole plate and new gasket. Install compressor flywheel. Install the compressor.

Step 2. Check cylinder bore for wear or out-of-round by disassembling to the extent necessary for repair. Refer to disas
instructions in Step 1. Inspect the bores for out-of-round by placing an inside micrometer in the top of the
bore and taking two measurements, 90° apart. Repeat the procedure halfway down the bore. The difference b
the two measurements is the amount the bore is out-of-round.

Replace or resize the cylinder if the bore is over 0.002 inch (.005 cm). Refer to instructions in Step reassemble.

Section III. GENERAL MAINTENANCE

5-5. General

This section contains maintenance data pertinent to direct support and general support maintenance personnel.

5-6. Repair and Replacement Standards

Table 5-2 lists manufacturer's sizes, tolera desired clearances and maximum allowable wea clearance for the air compressor, Models BGR- and HGR5-8M-1, and HGR5-8M-6.

Table 5-2. Compressor Repair and Replacement Standards

Points of measurement	Manufacturer's dimensions and tolerances in inches		Desired clearance		Max allo wea clea
	Minimum	Maximum	Minimum	Maximum	
Cylinders:					
Bore, low pressure	4.625 (11.7 cm)	4.625 (11.7 cm)	0.002 (.005 cm)	0.003 (.008 cm)	0.00 (.C2
Bore, high pressure	2.500 (6.4 cm)	2.5005 (6.4 cm)			3.00 (.02
Taper	0.001 (.003 cm)	0.001 (.003 cm)			
Out-of-round	0.001 (.003 cm)	0.001 (.003 cm)			0.00 (.00
Crankshaft:					
Journal size, main bearing	1.376 (3.5 cm)	1.377 (3.5 cm)			
Journal size, connecting rod	1.623 (4.1 cm)	1.625 (4.1 cm)			
Journal out-of-round		0.0005 (.001 cm)			
Journal taper		0.0002 (.0005 cm)			
Pistons, piston pins, piston rings:					
Piston size, low pressure	4.6195 (11.7 cm)	4.6200 (11.7 cm)			0.00 (.00
Piston size, high pressure	2.4970 (6.3 cm)	2.4975 (6.3 cm)			0.00 (.00
Piston pin diameter, low pressure	0.8122 (2.0 cm)	0.8125 (2.1 cm)			0.00 (.00
Piston pin, diameter, high pressure	0.8122 (2.0 cm)	0.8125 (2.1 cm)			0.00 (.00
Piston pin length, low pressure	2.125 (5.4 cm)	2.135 (5.4 cm)	0.0002 (.0005 cm)	0.0009 (.002 cm)	
Piston pin length, high pressure	2.125 (5.4 cm)	2.135 (5.4 cm)	0.0002 (.0005 cm)	0.0009 (.002 cm)	

Table 5-2. Compressor Repair and Replacement Standards—Continued

Points of measurement	Manufacturer's dimensions and tolerances in inches		Desired clearance		Maximum allowable wear and clearance
	Minimum	Maximum	Minimum	Maximum	
Piston pin clearance in piston			0.0002 (.0005 cm)	0.0009 (.002 cm)	
Piston to cylinder clearance, low pressure			0.00050 (.001 cm)	0.0055 (.01 cm)	
Piston to cylinder clearance, high pressure			0.0025 (.006 cm)	0.0030 (.008 cm)	
Piston ring side clearance, low pressure			0.0010 (.003 cm)	0.0025 (.006 cm)	
Piston ring side clearance, high pressure			0.0010 (.003 cm)	0.0045 (.01 cm)	
Piston ring gap, low pressure	0.013 (.03 cm)	0.023 (.06 cm)			
Piston ring gap, high pressure	0.007 (.02 cm)	0.017 (.04 cm)			
Connecting rods and journals:					
Bearing running clearance			0.0003 (.0008 cm)	0.0016 (.004 cm)	
Bearing side clearance			0.0040 (.01 cm)	0.0012 (.003 cm)	
Bearing internal diameter	1.376 (3.5 cm)	1.377 (3.5 cm)			
Rod internal diameter (cold)	1.627 (4.1 cm)	1.628 (4.1 cm)			

CHAPTER 6

REPAIR INSTRUCTIONS

6-1. General

The compressor assembly is an air-cooled, two-stage, two-cylinder reciprocating compressor. There is one low pressure piston and one high piston operating off a crankshaft. The crankshaft is supported at both ends by tapered roller bearings.

6-2. Pistons, Piston Rings, Connecting Rods, and Cylinder Block

a. Removal and Disassembly. (Model BGR-5M-1 and HGR5-8M-1).

(1) Remove the compressor.

(2) Remove the oil drain plug and pipe nipple as illustrated in figure 6-1, and drain oil.

UNSCREW AND
REMOVE FILLER
CAP
UNSCREW AND
REMOVE PLUG
UNSCREW AND
REMOVE DRAIN
PLUG
UNSCREW AND
REMOVE PLUG

Figure 6-1. Oil filler plugs, filler caps, removal and installation.

(3) Remove the belt guard as illustrated in figure 6-2.

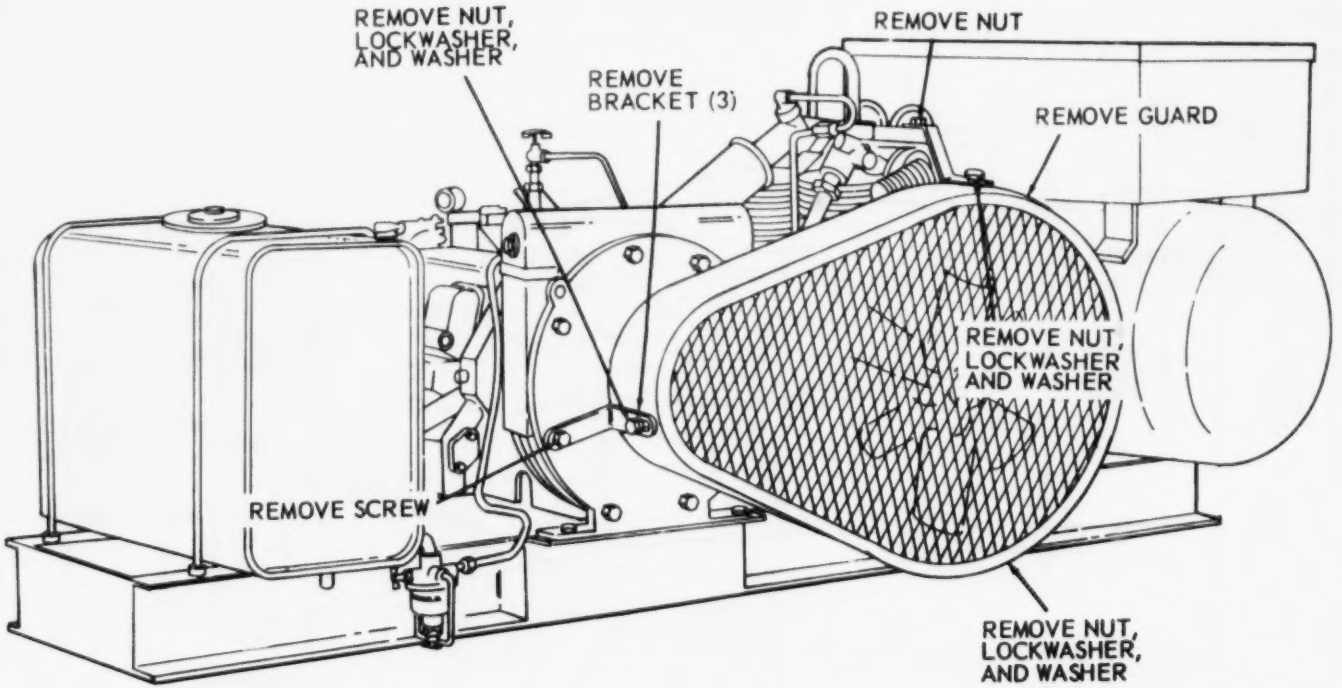


Figure 6-2. Belt guard, removal and installation.

(4) Remove the V-belts as illustrated in figure 6-3.

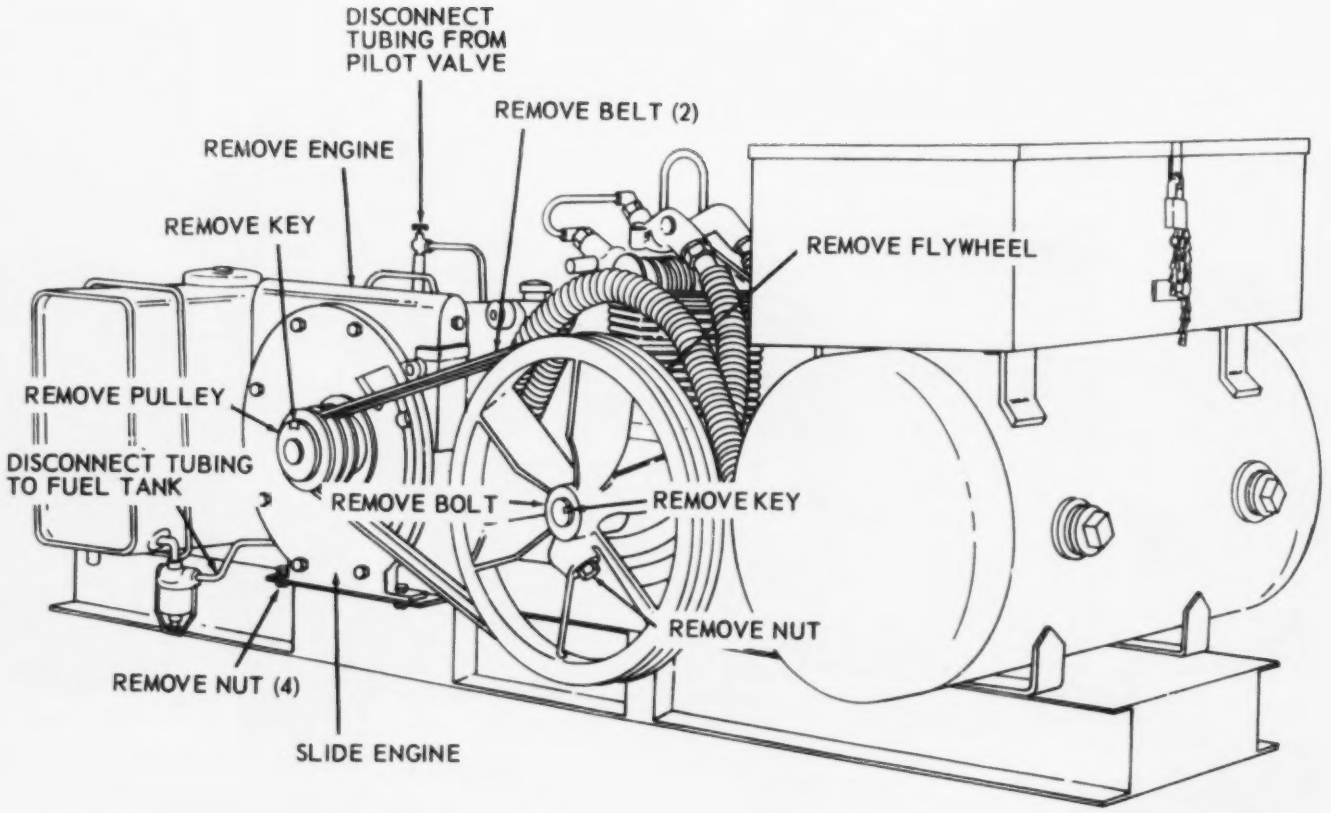


Figure 6-3. V-belts, drive pulley, flywheel, and engine, removal and installation.

(5) Remove the compressor flywheel as illustrated in figure 6-3.

(6) Refer to figure 6-4 and remove the tube assemblies, interstage safety valve, head unloaders, exhaust manifolds and intake and exhaust valves as follows:

(*a*) Remove the intercooler tubes (1, fig. 6-4), nuts (2) and ferrules (3).

(*b*) Remove aftercooler tube (4), nuts (5) and ferrules (6).

(*c*) Remove the unloading tube (7), nuts (8), and bodies (9).

(*d*) Remove breather tube (10), nuts (11), and bodies (12).

(*e*) Unscrew the setscrew (13) and free the air cleaner (14).

(*f*) Remove the manifold tube (15), nut (16), and body (17).

(*g*) Remove nuts (18), sleeves (19), and branch tee (20); remove actuating tubes (21).

(*h*) Remove nuts (22), sleeves (23), branch tee (24), and tubes (25).

(*i*) Disassemble valve (28) by removing nut (26) and sleeve (27).

(*j*) Remove cylinder (29) from bracket (30).

(*k*) Remove nut (31), screw (32), and arm (33).

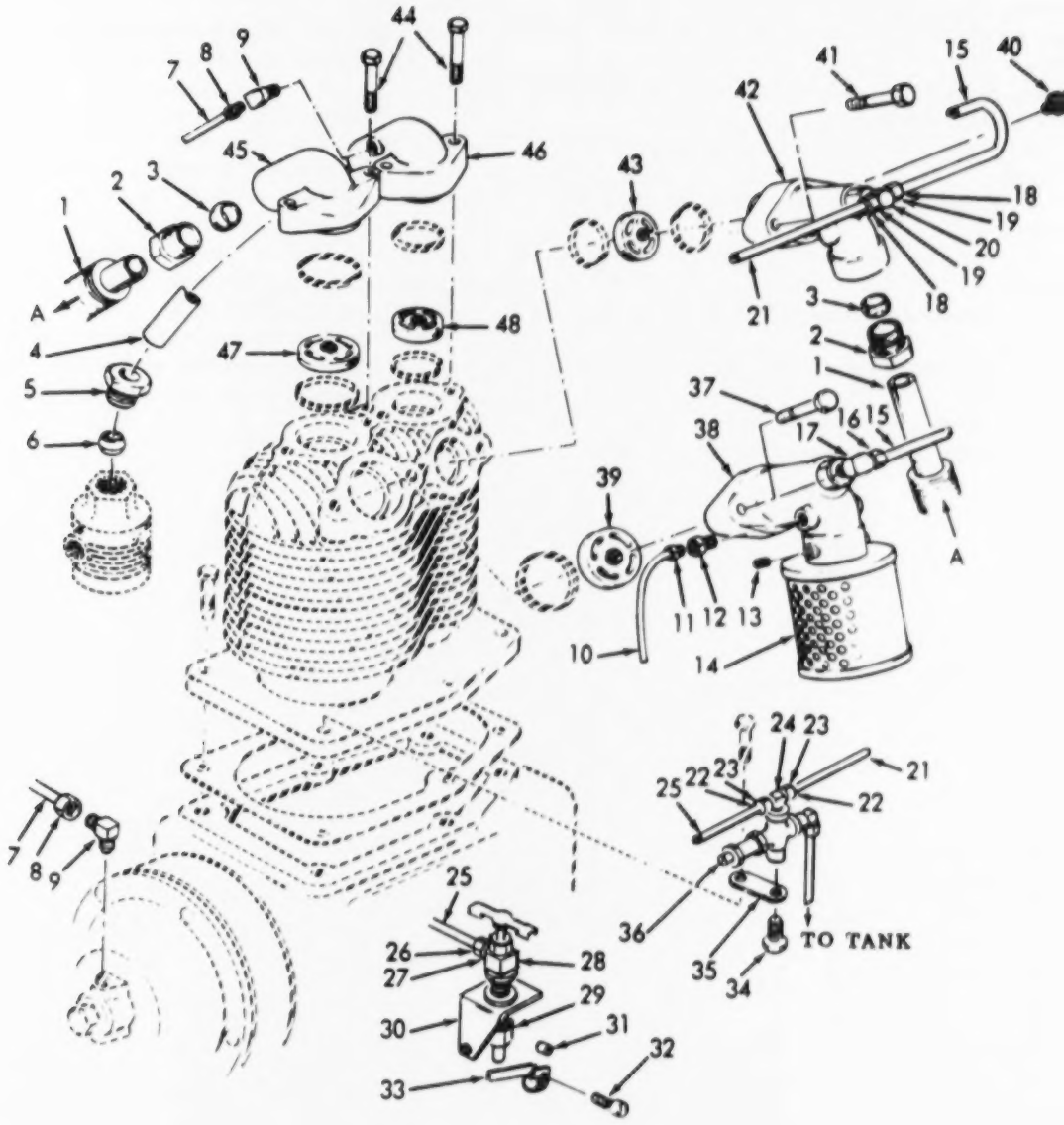
(*l*) Remove the screws (34) securing the bracket (35) to the pilot valve (36).

(*m*) Remove the mounting screws (37) and remove the intake manifold (38); remove intake valve assembly (39).

(*n*) Remove the interstage safety valve (40) from the intake manifold (42); remove mounting screws (41) and manifold (42).

(*o*) Remove the intake valve assembly (43).

(*p*) Remove mounting screws (44), exhaust manifolds (45 and 46) and exhaust valve assemblies (47 and 48).



TS 0239

Figure 6-4. Manifolds, valves, tubes and fittings, exploded view.

KEY to Figure 6-4.
1. Intercooler tube
2. Compression nut
3. Tube ferrule
4. Aftercooler tube
5. Compression nut
6. Tube ferrule
7. Unloading tube
8. Compression nut
9. Compression body
10. Breather tube
11. Compression nut
12. Compression body
13. Setscrew
14. Air cleaner
15. Manifold tube
16. Compression nut
17. Compression body
18. Compression nut
19. Sleeve
20. Branch tee
21. Actuating tube
22. Compression nut
23. Sleeve
24. Branch tee
25. Tube, pilot valve to pneumatic cylinder
26. Compression nut
27. Sleeve
28. Valve
29. Pneumatic cylinder
30. Bracket
31. Nut
32. Screw
33. Arm
34. Screw
35. Mounting bracket
36. Pilot valve
37. Screw
38. Low pressure intake manifold
39. Low pressure intake valve assembly
40. Interstage safety valve
41. Screw
42. High pressure intake manifold
43. High pressure intake valve assembly
44. Screw
45. Low pressure exhaust manifold
46. High Pressure exhaust manifold
47. Low pressure exhaust valve assembly
48. High pressure exhaust valve assembly

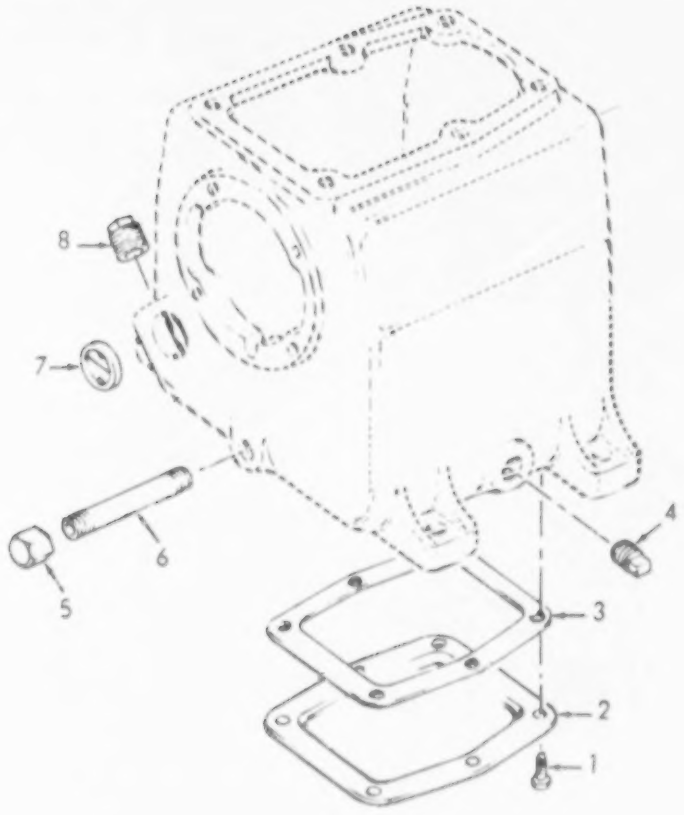
(7) Remove the handhole plate and gasket as follows:

(*a*) Remove the mounting capscrews (1, fig. 6-5) and remove the handhole plate (2) and gasket (3).

(*b*) Remove the plug (4).

(*c*) Remove cap (5) and nipple (6).

(*d*) Remove gage (7) and plug (8).



TS 023981

1. Capscrew
2. Handhole plate
3. Gasket
4. Plug
5. Cap
6. Nipple
7. Gage
8. Plug

Figure 6-5. Handhole plate and gasket, exploded view.

(8) Disconnect the connecting rods from the crankshaft by removing the connecting rod bolt (1, fig. 6-6) and connecting rod cap (2). The connecting rod and connecting rod cap are matching parts. Tag cap for identification to aid reassembly.

(9) Remove the cylinder block (5) with pistons and connecting rods in it, from the crankcase.

(10) Pull the assembled pistons and connecting rods from the cylinder block.

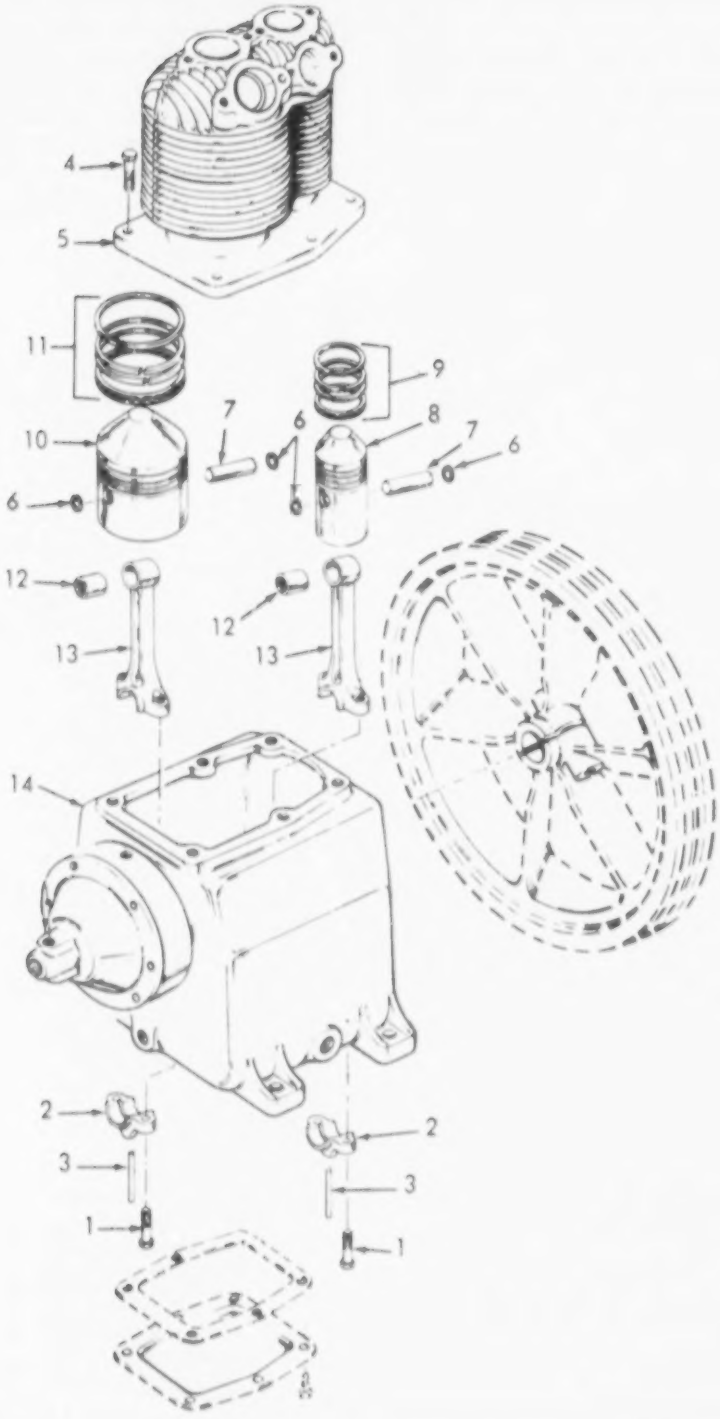
(11) Disassemble the pistons and connecting rods as follows. Tag all parts to insure correct reassembly.

(*a*) Remove retaining ring (6, fig. 6-6) and piston pins (7) and free pistons (8 and 10).

(*b*) Remove ring sets (9 and 11).

(*c*) Remove bearings (12) and rods (13) from crankcase (14).

KEY to Figure 6-6.
1. Connecting rod bolt (4)
2. Connecting rod cap (2) (matched with item
3. Oil dipper (2)
4. Cylinder block screw (6)
5. Cylinder block
6. Piston pin retaining ring (4)
7. Piston pin (2)
8. High pressure piston
9. High pressure piston ring set
10. Low pressure piston
11. Low pressure piston ring set
12. Piston pin bearing
13. Connecting rod
14. Crankcase assembly



TS 023982

Figure 6-6. Cylinder block, pistons, and connecting rods, exploded view.

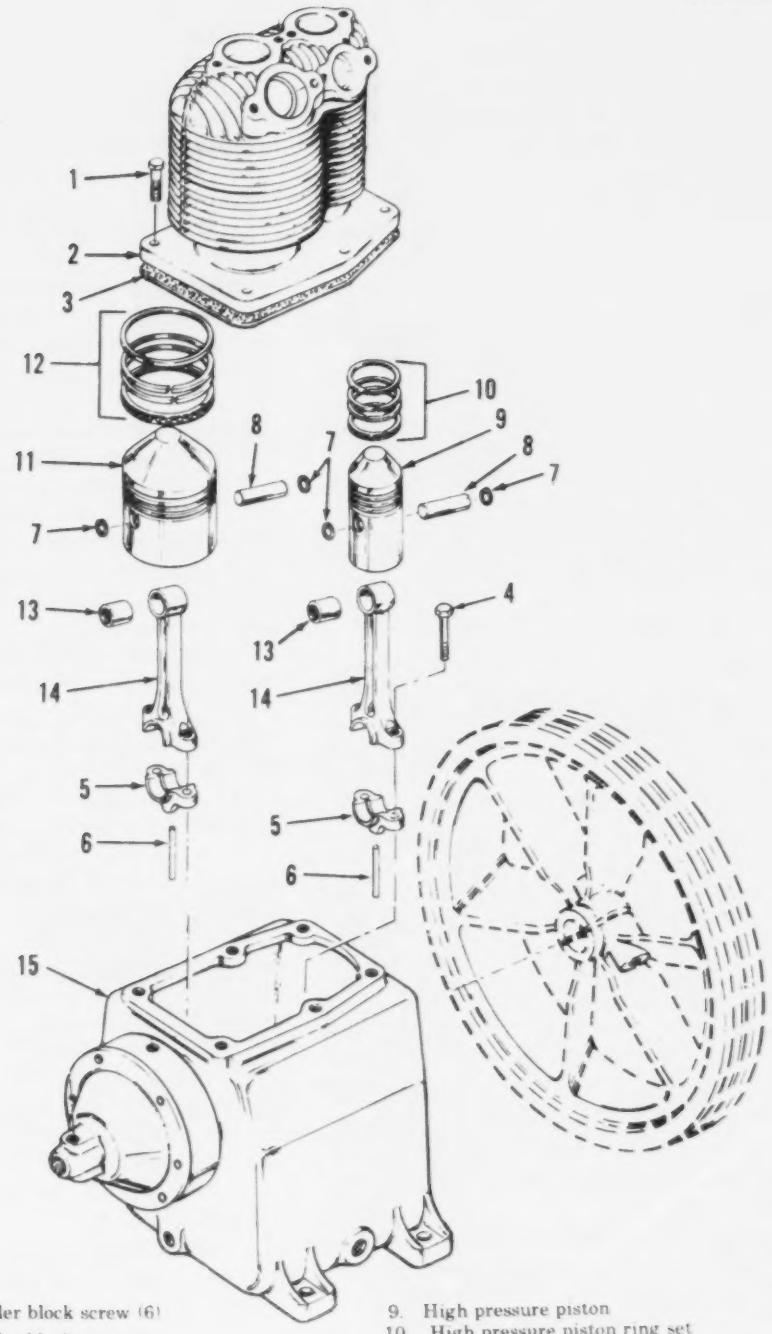
a.1. Removal and Disassembly (Model HGR5-8M-6).

(1) Perform steps (1) through (4) in *a* above.

(2) Access to connecting rod attaching belts (4, fig. 6-6.1) and connecting rod cap (5) is provided from above after cylinder block has been remov Remove the cylinder block (2).

(3) Remove connecting rod bolts (4) and wi draw connecting rod caps (5) from crankcase.

(4) Disassemble the pistons and connect rods in the numerical sequence illustrated in fig 6-6.1. Tag all parts to insure correct reassembly



1. Cylinder block screw (6)
2. Cylinder block
3. Cylinder block gasket
4. Connecting rod bolt (4)
5. Connecting rod cap (2) (matched with stem 13)
6. Oil dipper (2)
7. Piston pin retaining ring (4)
8. Piston pin (2)
9. High pressure piston
10. High pressure piston ring set
11. Low pressure piston
12. Low pressure piston ring set
13. Piston pin bearing
14. Connecting rod
15. Crankcase assembly

Figure 6-6.1. Cylinder block, pistons, and connecting rods, exploded view, (Model HGR5-8M 6).

b. Cleaning, Inspection and Repair.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38° C.) — 138° F. (59° C.).

(1) Clean all parts with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect the cylinder for broken cooling fins and cracks, replace a damaged cylinder.

(3) Inspect the cylinder bore for wear, scoring, pitting, or other damage. Inspect the bores for out-of-round by placing an inside micrometer in the top of the cylinder bore and taking two measurements, 90° apart. Repeat the procedure halfway down the bore. The difference between the two measurements is the amount the bore is out-of-round. Replace or resize the cylinder if the bore is over 0.002 inch (.005 cm).

(4) Measure the clearance of the piston pin in the piston pin bushing. Desired clearance is 0.0002 and 0.0009 inch (.0005 and .002 cm). Maximum allowable wear of piston pin diameter is 0.001 inch (.003 cm).

(5) Inspect the connecting rods for any visible damage or misalignment. Realign slightly twisted rods or replace if they are badly damaged.

(6) Place the piston rings in the cylinder bore in which they will be used and measure the ring gap with a feeler gage. Position the piston ring square with the cylinder bore about one half inch (1.27 cm) from the top. The correct gap for the small compression and oil rings is 0.0012 (.003 cm) plus or minus 0.005 inch (.01 cm).

(7) If the ring gap is less than the specified width, file across the butt ends of the ring to increase the gap to the required tolerance. If the ring gap is greater than 0.023 inch (.06 cm) for any ring, replace the entire set of rings.

(8) Measure the ring groove in the pistons for wear and side clearance, using a feeler gage between the ring and groove side wall. The desired ring groove clearance is 0.0010 to 0.0025 inch (.003 to .006 cm) for the low pressure rings and 0.0010 to 0.0045 inch (.003 to .01 cm) for the high pressure rings.

c. Assembly and Installation (Model BGR-5M and HGR5-8M-1).

(1) Reassemble the pistons and connecting rods as follows. Lubricate each piston and connecting rod assembly with a light coat of engine oil.

(a) Install bearings (12, fig. 6-6) in rods (13).

(b) Install ring sets (9 and 11) in pistons and 10).

(c) Install pins (7) and retaining rings (6

(2) Install the assembled pistons and connecting rods into the cylinder block. Install t cylinder block assembly to the crankcase. Tighte the cylinder block screws to 45 foot-pounds (6 kgm) torque.

(3) Attach connecting rods to crankshaft ar secure with connecting rod cap (2, fig. 6-6) ar connecting rod bolt (1). Tighten bolt to 25 foo pounds (3.5 kgm) maximum. The connecting rod ca and connecting rod are matched parts and should n be interchanged.

(4) Install the exhaust manifolds, hea unloaders, interstage safety valve, tube assemblie and intake and exhaust valves as follows:

(a) Install the exhaust valve assemblies (4 and 48, fig. 6-4) and the exhaust manifolds (45 an 46), secure with screws (44).

(b) Install intake valve assembly (43); ther install intake manifold (42) and secure with screw (41). Install the interstage safety valve (40).

(c) Install the intake valve assembly (39 install intake manifold (38) and secure with screw (37).

(d) Install bracket (35) to pilot valve (36 and secure with screws (34).

(e) Install arm (33) and secure with screw (32) and nut (31).

(f) Install bracket (30) and cylinder (29).

(g) Install sleeve (27) and nut (26) on valv (28).

(h) Install tubes (25), branch tee (24) sleeves (23) and nuts (22).

(i) Install actuating tubes (21), tee (20) sleeves (19), and nuts (18).

(j) Install body (17), nut (16) and tube (15).

(k) Install the air cleaner (14) back on the intake manifold and secure with setscrew (13).

(l) Install bodies (12), nuts (11), and breather tube (10).

(m) Install the bodies (9), nuts (8), and unloading tube (7).

(n) Install ferrules (6), nuts (5) and tube (4).

(o) Install ferrules (3), nuts (2), and intercooler tubes (1).

(5) Install the handhole plate and new gasket as follows:

(a) Install the handhole plate (2, fig. 6-5) and new gasket (3) with its attaching screws(1). Tighten screws to 25 foot-pounds (3.5 kgm).

(b) Install plugs (4 and 8).

(c) Install gage (7), nipple (6), and cap (5).

(6) Install compressor flywheel, as illustrated in figure 6-3.

(7) Install the V-belts, as illustrated in figure 6-3.

(8) Install the belt guard, as illustrated in figure 6-2.

(9) Install the pipe nipple and oil drain plug, as illustrated in figure 6-1.

(10) Install the compressors.

c.1. Assembly and Installation (Model HGR5-8M-6).

(1) Reassemble the pistons and connecting rods in reverse of the numerical sequence illustrated in figure 6-6.1. Lubricate each piston and connecting rod assembly with a light coat of engine oil.

(2) Attach assembled pistons and connecting rods to crankshaft and secure with connecting rod cap (5, fig. 6-6.1) and connecting rod bolt (4). Tighten bolt to 25 foot-pounds (3.57 kg - m) maximum. The connecting rod caps and connecting rods are matched parts, and should not be interchanged.

(3) Carefully install cylinder block (2) on to previously assembled piston, using a piston ring clamp to insert pistons into cylinders. Remove clamp. Install new cylinder block gasket (3), then secure cylinder block assembly to crankcase. Tighten the cylinder block screws to 45 footpounds (6.224 kg - m) torque.

(4) Proceed with compressor reassembly following steps (4) through (10) except item (5) (not applicable to model HGR5-8M-6).

6-3. Crankshaft, Bearings, and Oil Seal

a. Removal and Disassembly (Model BGR-5M-1 and HGR5-8M-1).

(1) Remove the compressors.

(2) Remove oil drain plug.

(3) Remove flywheel.

(4) Remove handhole plate and gasket.

(5) Remove the centrifugal unloader.

(6) Remove the connecting rod caps (2, fig. 6-7). The connecting rods are accessible through the handhole plate in the bottom of the crankcase. The caps are matched with the connecting rod. Tag the cap to identify it with appropriate rod to assist in proper reassembly.

(7) Remove the crankshaft (5) from the crankcase (9) as illustrated in figure 6-7. The bearings are pressed on the shaft and will come out with the crankshaft.

(8) Place the crankshaft in a suitable press and carefully remove the two tapered bearing cones and rollers from the crankshaft.

(9) Using a blunt instrument drive the bearing cup (7, fig. 6-7) and oil seal (8) out of the flywheel side of the crankcase. Discard oil seal. Remove the bearing cup (7) from the loader housing.

b.1. Removal and Disassembly (Model HGR5-8M-6).

(1) Remove the compressor, paragraph 3-51.

(2) Remove oil drain plug, paragraph 3-11 and drain oil.

(3) Remove flywheel, paragraph 3-31.

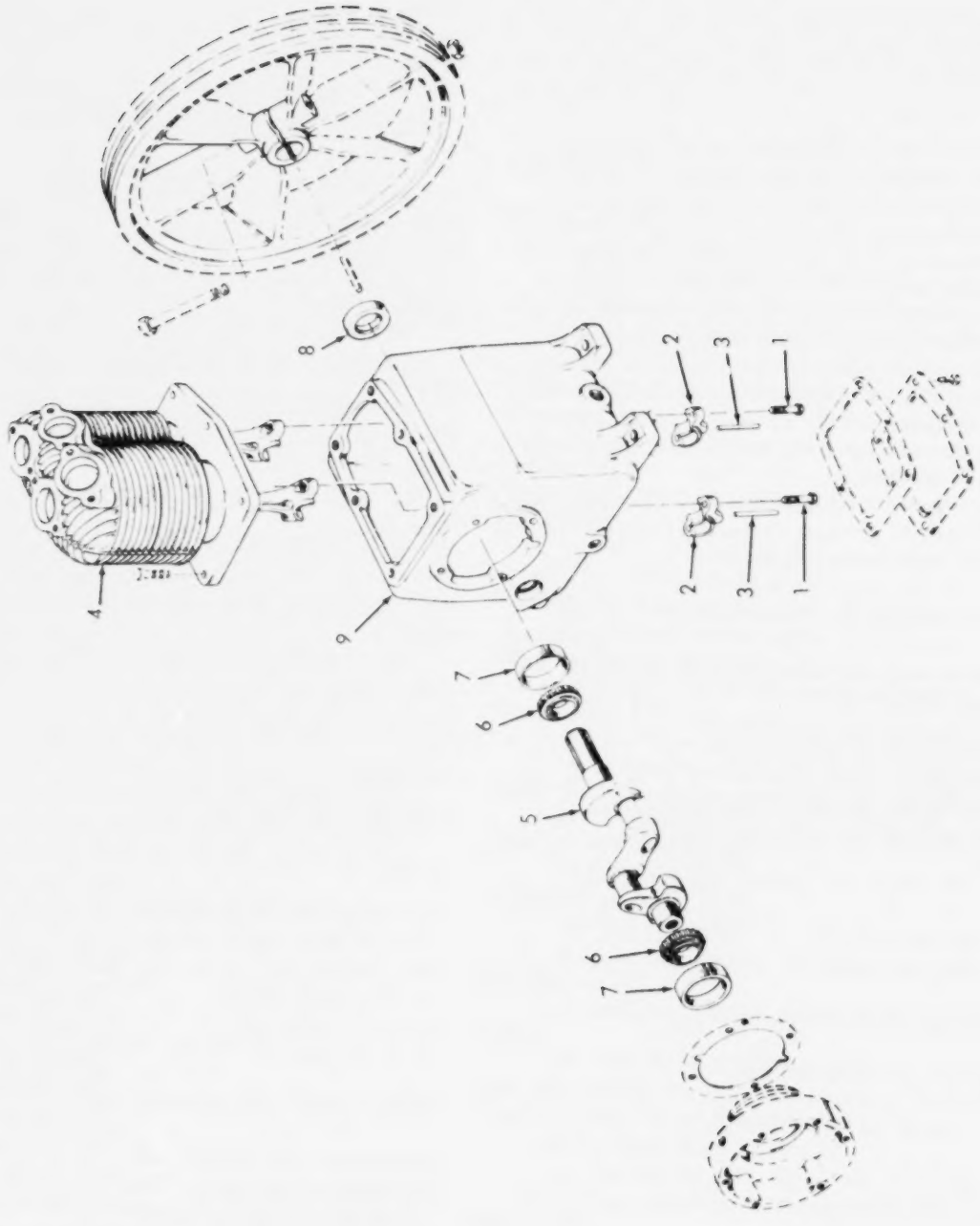
(4) Remove the centrifugal unloader, paragraph 4-29.

(5) Remove cylinder block assembly, paragraph 6-2.

(6) Location of the connecting rod attaching bolts (1, fig. 6-7.1) and connecting rod cap (2) is provided from above after cylinder block has been removed.

(7) Remove connecting rod bolts and withdraw connecting rod caps from crankcase. The caps are matched with the connecting rod. Tag the cap to identify it with appropriate rod to assist in proper reassembly.

(8) Proceed with disassembly following steps (7) through (9) paragraph 6-3*a*.



TS 023983

KEY to figure 6-7.

1. Connecting rod bolt (4)
2. Connecting rod cap (2)
3. Oil dipper (2)
4. Cylinder block and piston assembly
5. Crankshaft
6. Bearing cone and roller (2)
7. Bearing cup (2)
8. Oil seal
9. Crankcase

b. Cleaning, Inspection and Repair.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. (38°C.) - 138°F. (59°C.).

(1) Clean all parts except the bearings with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Place the bearings in a wire basket, dip in cleaning solvent, Federal Specification P-D-680, and dry with low pressure compressed air. Do not spin the rollers. Dip in light oil.

(3) Inspect the bearings for free and even rotation. Replace of defective.

(4) Inspect the crankshaft for cracks, scores, and distortion. Measure the crankshaft bearing journals for wear, using an outside micrometer. If the shaft measures more than 0.0005 (.001 cm) out-of-round, metallize the crankshaft and turn down to correct size. The correct size for main bearing journals is 1.376 to 1.377 inches (3.5 to 3.50 cm). The correct size for connecting rod journals is 1.623 to 1.625 inches (4.1224 to 4.1275 cm).

(5) Inspect the bearing cups for scores, burrs, pits or burned surfaces. Replace defective bearing cups.

(6) Inspect the crankcase for breaks, cracks, chips or other defects. Replace if defective.

c. Assembly and Installation (Model BGR-5M-1, and HGR5-8M-1).

(1) Use a suitable bearing cup driver to press the bearing cup (7, fig. 6-7) and a new oil seal (8) in the crankcase. Install the remaining bearing cup in the unloader body in the same manner.

(2) Press the tapered bearing cones and rollers (6, fig. 6-7) on the crankshaft (5).

(3) Install the assembled crankshaft (5) and tapered bearing cone and rollers in the crankcase, and install the connecting rod caps.

(4) Install the centrifugal unloader.

(5) Install handhole plate and new plate gasket.

(6) Install the pipe nipple and oil drain plug in the crankcase.

(7) Install flywheel.

(8) Install compressors.

c.1. Assembly and Installation (Model HGR5-8M-6).

(1) Reassemble the crankshaft paragraph 6-3*c*, (1) and (2).

(2) Install the assembled crankshaft and tapered bearing cone and rollers in the crankcase, then install assembled pistons, rod caps, cylinder block, paragraph 6-2*c*, (1) through (4).

6-4. Frame Assembly

a. Removal.

(1) Remove the compressor, paragraph 4-21.

(2) Remove the engine, paragraph 4-39.

(3) Remove the air receiver, paragraph 4-37.

b. Disassembly.

(1) Remove the nuts (1, fig. 6-8), washers (2), and screws (3) securing the front and rear plates; remove plates (4 and 5).

(2) Remove the drive screws (6) and identification plate (7).

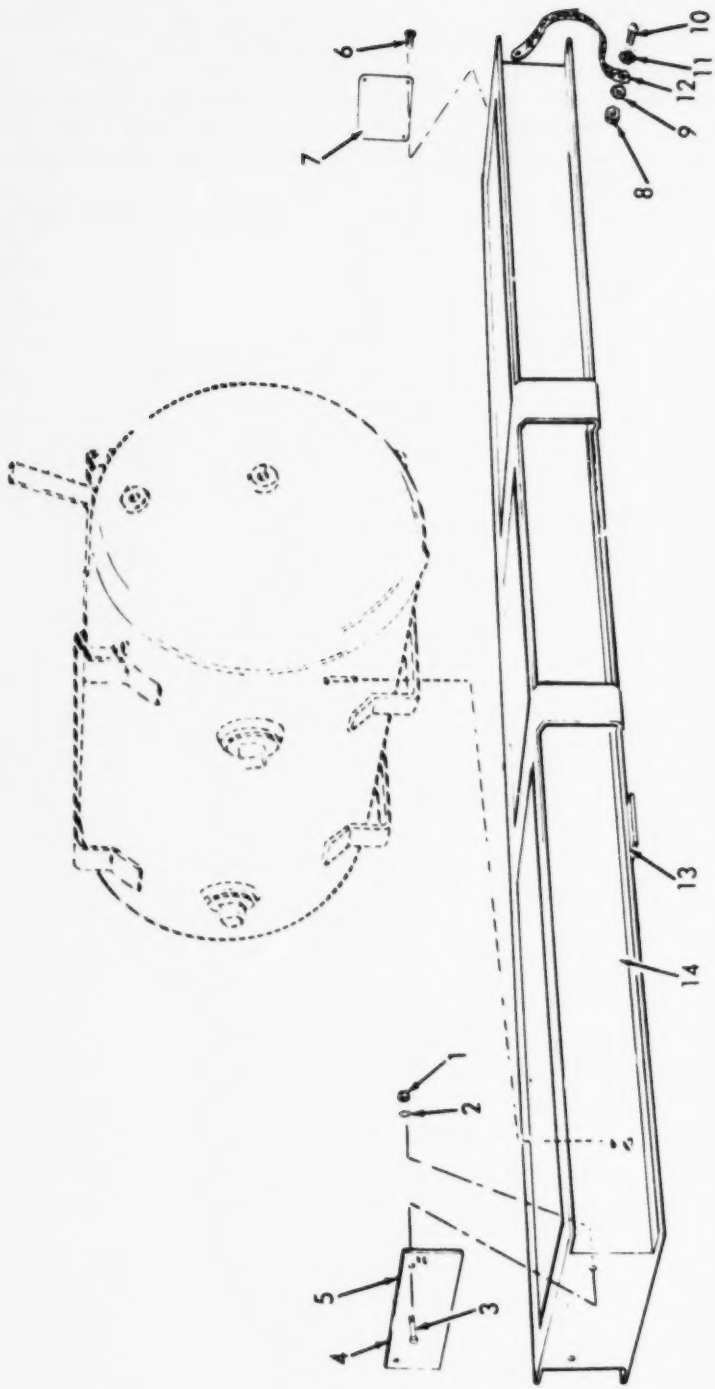
(3) Remove nut (8), washer (9), screw (10), washer (11), and strap (12).

(4) Remove side plates (13) from base (14).

Figure 6-7. Crankshaft, crankcase and related parts, exploded view.

1. Connecting rod bolt (4)
2. Connecting rod cap (2)
3. Oil dipper (2)
4. Connecting rod and piston assembly
5. Crankshaft
6. Bearing cone and roller (2)
7. Bearing cup (2)
8. Oil seal
9. Crankcase

Figure 6-7.1. Crankshaft, crankcase and related parts, exploded view (Model HGR5-8M-6).



1. Nut
2. Washer
3. Screw
4. Plate
5. Plate
6. Screw
7. Identification plate
8. Nut
9. Washer
10. Screw
11. Washer
12. Strap
13. Plate
14. Base

Figure 6-8. Base assembly (model BGR-5M-1).

c. Cleaning, Inspection and Repair.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F. (38°C.) — 138° F. (59° C.).

(1) Clean items with cleaning solvent, Federal Specification P-D-680, and dry thoroughly.

(2) Inspect frame for cracks, breaks, and broken welds.

(3) Weld breaks or replace the base assembly.

d. Assembly.

(1) Install the side plates (13, fig. 6-8) on the base (14).

(2) Install the strap (12) and secure with washer (11), screw (10), washer (9), and nut (8).

(3) Install the identification plate (7) and secure with drive screws (6).

(4) Install plates (4 and 5) and secure with screws (3), washers (2), and nuts (1).

e. Installation.

(1) Install air receiver, paragraph 4-37.

(2) Install engine, paragraph 4-39.

(3) Install compressor, pagagraph 4-21.

APPENDIX A

REFERENCES

A-1. Fire Protection and Safety

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users.

A-2. Lubrication

C9100IL	Fuels, Lubricants, Oils, and waxes.
LO 5-2805-203-12	Engine, Gasoline, Military Standard (Models 4A032-1 and -2).
LO 5-4310-277-12	Compressor, Reciprocating Air (Champion Pneumatic Models HGR5-8M-1, BGR-5M-1, and HGR5-8M-6).

A-3. Painting

AR 740-1	Color, Marking and Preparation of Equipment for Shipment.
TM 43-0139	Painting Instructions for Field Use.

A-4. Cleaning

P-D-680	Dry Cleaning Solvent.
TM 38-230-1	Preservation, Packaging, and Packing of Military Supplies and Equipment (Cleaning).

A-5. Maintenance

TM 5-4310-277-25P	Compressor, Reciprocating Air (Champion Pneumatic Models HGR5-8M-1 and BGR-5M-1, and HGR5-8M-6).
TM 38-750	The Army Maintenance Management System (TAMMS).

A-6. Shipment and Storage

TM 38-230-2	Preservation, Packaging and Packing of Military Supplies and Equipment (Packing).
TM 740-90-1	Administrative Storage of Equipment.

A-7. Demolition

TM 750-244-3	Destruction of Equipment to Prevent Enemy Use.

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions, explanatory notes and/or illustrations required for a particular maintenance function.

B-2. Explanation of Columns in Section II

a. Column (1.), Group Number. Column 1 lists group numbers to identify related components, assemblies, sub-assemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. Column (2.), Component/Assembly. This column contains the noun names of components, assemblies, sub-assemblies and modules for which maintenance is authorized.

c. Column (3.), Maintenance Functions. This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

(1) *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

(2) *Test.* To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

(3) *Sevvice.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminated), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

(4) *Adjust.* To maintain within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

(5) *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurements. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

(7) *Install.* The act of emplacing, seating, or fixing into position an item, part or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

(8) *Replace.* The act of substituting a serviceable like type part, sub-assembly, or module (component or assembly) for an unserviceable counterpart.

(9) *Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, sub-assembly, module (component or assembly), end item, or system.

(10) *Overhaul.* That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condidtion as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

(11) *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those

age measurments (hours/miles, etc.) considered in classifying Army equipment/components.

d. Column (4) Maintenance Category. This column is made up of sub-columns for each category of maintenance. Work time figures are listed in these sub-columns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate the average active time required to perform the maintenance function at the indicated category of maintenance under typical field operating conditions.

e. Column (5), Tools and Equipment. This column is provided for referencing by code, the common tool sets (not individual tools) special tools, test and support equipment required to perform the designated function.

B-3. Explanation of Columns in Section III

a. Column (1), Reference Code. This column consists of an arabic number listed in sequence from column 5 of Section II. The number references the common tool sets, special tools and test equipment requirements.

b. Column (2), Maintenance Category. Th column shows the lowest category of maintenan authorized to use the special tools or test equipmen

c. Column (3), Nomenclature. This column lis the name or indentification of the common tool set special tools or test equipment.

d. Column (4), National/Nato Stock N (NSN). This column is provided for the NSN common tool sets, special tools and test equipme listed in the nomenclature column.

e. Column (5), Tool Number. This column lis the manufacturer's code and part number of too and test equipment.

B-4. Explanation of Columns in Section IV

a. Reference Code. This column consists of th maintenance functions as described in paragraph B 2, step *c*.

b. Remarks. This column lists informatio pertinent to the maintenance function to be pe formed.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group number	(2) Component assembly	(3) Maintenance function	(4) Maintenance category C	O	F	H	D	(5) Tools and equipment
01	FUEL SYSTEM (TANK, LINES, AND FILTER)	Inspect		0.1				
		Service		0.1				
		Replace		0.2				
		Repair		0.3				
02	THROTTLE CONTROL (THROTTLE ARM, VALVE, PNEUMATIC CYLINDER, AND ASSOCIATED PARTS)	Adjust		0.2				
				0.3				
03	EXHAUST SYSTEM (MUFFLER AND BRACKETS)	Inspect		0.1				
				0.2				
04	TOOL BOX	Inspect		0.1				
		Replace		0.2				
05	DRIVE COMPONENTS							
	Belt Guard	Inspect		0.1				
		Replace		0.2				
	V-Belts	Inspect	0.1					
		Adjust		0.2				
		Replace		0.2				
	Drive Pulley	Inspect		0.1				
		Replace		0.4				
06	COMPRESSOR ASSEMBLY							
	Compressor	Inspect		0.2				
		Replace		0.8				
		Repair			1.0			
		Overhaul				4.0		
	Air Cleaner	Inspect	0.1					
		Replace	0.2					

* SUBCOLUMNS ARE AS FOLLOWS: C - OPERATOR CREW; O - ORGANIZATIONAL; F - DIRECT SUPPORT; H - GENERAL SUPPORT; D - DEPOT

** INDICATES WT MH REQUIRED

Maintenance Allocation Chart—Continued

(1) Group number	(2) Component assembly	(3) Maintenance function	(4) Maintenance category C	O	F	H	D	(5) Tools and equipment
	Oil Filler, Cap and Plugs	Inspect	0.1					
		Replace	0.2					
	Flywheel	Inspect		0.2				
		Replace		0.3				
	Tube Assemblies	Inspect		0.2				
		Replace		0.3				
	Interstage Safety Valve	Inspect		0.1				
		Replace		0.2				
	Head Unloaders and Pilot Valve	Inspect		0.1				
		Replace		0.2				
		Repair		0.3				
		Adjust		0.2				
	Exhaust Manifolds	Inspect		0.1				
		Replace		0.2				
	Intake and Exhaust Valves	Inspect		0.2				
		Replace		0.3				
		Repair		0.6				
	Centrifugal Unloader	Inspect		0.2				
		Replace		0.3				
		Repair		0.5				
	Handhole Plate	Inspect		0.1				
		Replace		0.2				
	Pistons, Connecting Rods and Block	Inspect			0.3			
		Replace			0.5			
		Repair			2.0			
	Crankshaft, Bearings and Oil Seal	Inspect			0.4			
		Replace			0.6			
		Repair			2.5			
07	COMPRESSOR CONTROLS AND INSTRUMENTS							
	Safety Valve	Inspect		0.1				
		Replace		0.2				
	Check Valve	Inspect		0.1				
		Replace		0.2				
		Repair		0.3				
	Pressure Gage	Inspect		0.1				
		Replace		0.2				
	Globe Valve and Inflator Gage	Inspect		0.1				
		Replace		0.2				
		Repair		0.3				
	Oil Level Gage	Inspect		0.1				
		Replace		0.2				
	Draincock	Inspect		0.1				
		Replace		0.1				
08	AIR RECEIVER	Inspect	0.1					
		Replace		0.4				
09	ENGINE ASSEMBLY							(1)
	Engine	Inspect		0.1				
		Replace		0.8				
	Plugs	Inspect	0.1					
		Replace	0.2					
10	FRAME ASSEMBLY							
	Base	Inspect			0.2			
		Replace			0.3			
		Repair			0.4			
11	FIRE EXTINGUISHER	Inspect	0.1					
		Replace	0.2					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference code	(2) Maintenance Category	(3) Nomenclature	(4) National Stock number (NSN)	(5) Tool number
		No special tools required.		

Section IV. REMARKS

Reference code	Remarks
(1)	Test includes engine operation and compression.

ALPHABETICAL INDEX

	Paragraph	Page
A		
Administrative Storage	1-5	1-1
Air Receiver:		
Cleaning, Inspection and Repair	4-37*b*.	4-50
Inspection	3-13*a*.	3-10
Removal	4-37*a*.	4-48
Replacement	3-13*b*.	3-10
B		
Belt Guard:		
Cleaning and Inspection	4-18*b*.	4-27
Installation	4-18*c*.	4-27
Removal	4-18*a*.	4-25
C		
Centrifugal Unloader:		
Assembly and Installation	4-29*c*.	4-41
Cleaning and Inspection	4-29*b*.	4-41
Removal and Disassembly	4-29*a*.	4-39
Check Valve:		
Assembly and Installation	4-32*c*.	4-46
Cleaning and Inspection	4-32*b*.	4-46
Removal and Disassembly	4-32*a*.	4-45
Compressor Air Cleaner:		
Assembly	3-9*c*.	3-8
Cleaning, Inspection and Repair	3-9*b*.	3-8
Disassembly	3-9*a*.	3-6
Compressor Flywheel:		
Cleaning and Inspection	4-23*b*.	4-33
Installation	4-23*c*.	4-33
Removal	4-23*a*.	4-32
Compressor (Model BGR-5M-1):		
Cleaning and Inspection	4-21*c*.	4-31
General	4-21*a*.	4-29
Installation	4-21*d*.	4-31
Removal	4-21*b*.	4-29
Compressor (Model HGR5-8M-1):		
Cleaning and Inspection	4-22*b*.	4-32
Installation	4-22*c*.	4-32
Removal	4-22*a*.	4-31
Compressor Oil Drain Plug:		
Cleaning and Inspection	3-11*b*.	3-10
Installation	3-11*c*.	3-10
Removal	3-11*a*.	3-10
Compressor Oil Filler Plug:		
Cleaning and Inspection	3-10*b*.	3-10
Installation	3-10*c*.	3-10
Removal	3-10*a*.	3-8
Controls and Instruments	2-2	2-1
Crankshaft, Bearings, and Oil Seal:		
Assembly and Installation	6-3*c*.	6-13
Cleaning, Inspection and Repair	6-3*b*.	6-13
Removal and Disassembly	6-3*a*.	6-11
D		
Description:		
Air Receiver Tank	1-6*d*.	1-8
Compressor	1-6*b*.	1-8
Engine	1-6*c*.	1-8

	Paragraph	Page
D		
Description—continued:		
General	1-6*a*.	1-2
Trailer (Model BGR-5M-1 Only)	1-6*e*.	1-9
Destruction of Army Materiel to Prevent Enemy Use:		
Demolition by Explosives or Weapons Fire	1-4*c*.	1-1
Demolition to Render the Equipment Inoperative	1-4*b*.	1-1
General	1-4*a*.	1-1
Other Demolition Methods	1-4*d*.	1-1
Detailed Lubrication Information:		
Cleaning	3-2*b*.	3-4
Engine Lubrication	3-2*e*.	3-4
General	3-2*a*.	3-4
OES Oil	3-2*d*.	3-4
Points of Lubrication	3-2*c*.	3-4
Trailer Lubrication (Model BGR-5M-1 Only)	3-2*f*.	3-4
Difference in Models and Serial Numbers	1-8	1-14
Direct Support and General Support Maintenance Troubleshooting	5-4	5-1
Dismantling for Movement	4-3	4-7
Draincock:		
Cleaning and Inspection	4-36*b*.	4-48
Removal	4-36*a*.	4-48
E		
Engine:		
Cleaning and Inspection	4-39*b*.	4-52
Removal	4-39*a*.	4-50
Engine Drive Pulley:		
Cleaning and Inspection	4-20*c*.	4-31
General	4-20*a*.	4-29
Installation	4-20*d*.	4-31
Removal	4-20*b*.	4-29
Engine (Model HGR5-8M-1):		
Cleaning and Inspection	4-41*b*.	4-53
Removal	4-41*a*.	4-52
Engine Muffler and Brackets:		
Cleaning and Inspection	4-16*b*.	4-23
Installation	4-16*c*.	4-23
Removal	4-16*a*.	4-22
Engine Oil Drain Plug:		
Cleaning and Inspection	3-14*b*.	3-10
Installation	3-14*c*.	3-10
Removal	3-14*a*.	3-10
Engine Oil Filler Cap:		
Cleaning and Inspection	3-12*b*.	3-10
Installation	3-12*c*.	3-10
Removal	3-12*a*.	3-10
Equipment Serviceability Criteria (ESC)	1-3	1-1
Exhaust Manifolds:		
Cleaning and Inspection	4-27*b*.	4-37
Installation	4-27*c*.	4-37
Removal	4-27*a*.	4-37

	Paragraph	Page
F		
Fire Extinguisher (Carbon Dioxide Type):		
Description	3-16*a*.	3-11
Maintenance	3-16*c*.	3-11
Operation	3-16*b*.	3-11
Fire Extinguisher (Dry Chemical Type):		
Description	3-17*a*.	3-11
Maintenance	3-17*c*.	3-11
Operation	3-17*b*.	3-11
Fire Extinguisher (Monobromotrifluromethane Type):		
Description	3-15*a*.	3-10
Maintenance	3-15*d*.	3-11
Operation	3-15*b*.	3-10
Replacement of Cylinder	3-15*c*.	3-10
Frame Assembly:		
Assembly	6-4*d*.	6-15
Cleaning, Inspection and Repair	6-4*c*.	6-15
Disassembly	6-4*b*.	6-13
Installation	6-4*e*.	6-15
Removal	6-4*a*.	6-13
Fuel Tank:		
Assembly and Installation	4-12*c*.	4-20
Cleaning and Inspection	4-12*b*.	4-20
Removal and Disassembly	4-12*a*.	4-18
G		
General Lubrication Information	3-1	3-1
General Maintenance:		
General	5-5	5-2
Globe Valve and Inflator Gage:		
Assembly and Installation	4-34*c*.	4-47
Cleaning and Inspection	4-34*b*.	4-47
Removal and Disassembly	4-34*a*.	4-46
H		
Handhole Plate and Gasket:		
Cleaning and Inspection	4-30*b*.	4-42
Installation	4-30*c*.	4-42
Removal	4-30*a*.	4-41
Head Unloaders and Pilot Valve:		
Adjustment, Pilot Valve	4-26*h*.	4-37
Assembly and Installation, Head Unloaders	4-26*d*.	4-35
Assembly and Installation, Pilot Valve	4-26*g*.	4-37
Cleaning and Inspection, Head Unloaders	4-26*c*.	4-35
Cleaning and Inspection, Pilot Valve	4-26*f*.	4-36
General	4-26*a*.	4-33
Removal and Disassembly, Head Unloaders	4-26*b*.	4-34
Removal and Disassembly, Pilot Valve	4-26*e*.	4-36
I		
Inspecting and Servicing Equipment	4-1	4-1
Installation	4-2	4-5
Intake and Exhaust Valves:		
Assembly and Installation	4-28*c*.	4-38
Cleaning and Inspection	4-28*b*.	4-38
Removal and Disassembly	4-28*a*.	4-37
Interstage Safety Valve:		
Cleaning and Inspection	4-25*b*.	4-33
Removal	4-25*a*.	4-33
M		
Maintenance Forms and Records	1-2	1
Maintenance of Engine (Model BGR-5M-1): General	4-38	4-
Maintenance of Engine (Model HGR5-8M-1): General	4-40	4-
Maintenance of Exhaust System, General	4-15	4-
Maintenance of Fuel System, General	4-11	4-
Maintenance of Throttle Control, General	4-13	4-
Maintenance Procedures, General	3-7	3
Maintenance Repair Parts	4-6	4
	5-2	5
O		
Oil Level Gage:		
Cleaning and Inspection	4-35*b*.	4-
Installation	4-35*c*.	4-
Removal	4-35*a*.	4-
Operating Procedures, General	2-1	2-
Operation at High Altitudes	2-11	2-
Operation in Dusty or Sandy Areas	2-8	2-
Operation in Extreme Cold (Below 0° F.) (-18° C.)	2-6	2-
Operation in Extreme Heat	2-7	2-
Operation in Salt Water Areas	2-10	2-
Operation Under Rainy or Humid Conditions	2-9	2-
Operation Under Usual Conditions	2-5	2-
Operator Maintenance Troubleshooting	3-6	3-
Organizational Maintenance Troubleshooting	4-10	4-
P		
Pistons, Piston Rings, Connecting Rods, and Cylinder Block:		
Assembly and Installation	6-2*c*.	6-
Cleaning, Inspection and Repair	6-2*b*.	6-
Removal and Disassembly	6-2*a*.	6-
Pressure Gage:		
Cleaning and Inspection	4-33*b*.	4-
Removal	4-33*a*.	4-
Preventive Maintenance Checks and Services	3-4	3-
	4-8	4-
Preventive Maintenance Checks and Services, General	3-3	3-
	4-7	4-
R		
Reinstallation After Movement	4-4	4-
Repair and Replacement Standards	5-6	5-
Repair Instructions:		
General	6-1	6-
S		
Safety Valve:		
Cleaning and Inspection	4-31*b*.	4-
Removal	4-31*a*.	4-
Scope	1-1	1-
Special Tools and Equipment	4-5	4-
	5-1	5-
Starting	2-3	2-
Stopping	2-4	2-

	Paragraph	Page
T		
Tabulated Data:		
Identification:		
Air Compressor Plate	1-7*a*.(2)	1-11
Identification Plate	1-7*a*.(1)	1-9
Tabulated Data:		
Air Compressor (Air Receiver Mounted)	1-7*b*.(2)	1-12
Air Compressor (Trailer Mounted)	1-7*b*.(1)	1-12
Air Receiver, Model BGR-5M-1	1-7*b*.(5)	1-12
Air Receiver, Model HGR5-8M-1	1-7*b*.(6)	1-12
Capacities	1-7*b*.(7)	1-12
Compressor (For Models BGR-5M-1 and HGR-5-8M-1)	1-7*b*.(3)	1-12
Dimensions and Weights, Model BGR-5M-1	1-7*b*.(8)	1-12
Dimensions and Weights, Model HGR5-8M-1	1-7*b*.(9)	1-12
Engine	1-7*b*.(4)	1-12
Mounting Dimensions, Model HGR5-8M-1	1-7*b*.(10)	1-12
Nut and Bolt Torque Data	1-7*b*.(12)	1-14
Trailer, Model BGR-5M-1	1-7*b*.(11)	1-14
Throttle Arm, Valve, Pneumatic Cylinder, and Associated Parts:		
Adjustment	4-14*d*.	4-22
Assembly and Installation	4-14*c*.	4-22
Cleaning and Inspection	4-14*b*.	4-21
Removal	4-14*a*.	4-20
T		
Tool Box Assembly:		
Cleaning and Inspection	4-17*b*.	4-25
Installation	4-17*c*.	4-25
Removal	4-17*a*.	4-23
Troubleshooting, General	3-5	3-6
	4-9	4-10
	5-3	5-1
Tube Assemblies:		
Cleaning and Inspection	4-24*c*.	4-33
General	4-24*a*.	4-33
Installation	4-24*d*.	4-33
Removal	4-24*b*.	4-33
V		
V-Belts:		
Adjustment	4-19*d*.	4-29
Adjustment and Replacement	3-8*b*.	3-6
Cleaning and Inspection	4-19*b*.	4-29
Inspection	3-8*a*.	3-6
Installation	4-19*c*.	4-29
Removal	4-19*a*.	4-27

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:
PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A (qty rqr block no. 17), Operator requirements for Compressor Air, 15 CFM.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1990 0 - 261-872 (21086)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
CoA, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE 16 DEC 74

PUBLICATION NUMBER	DATE	TITLE
TM5-6115-200-20 AND P	1 APR 72	GENERATOR SET 10 KW NSN 6115-00-231-7296

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
6	2-1 a		
81		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN

SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE:
John Doe

TEAR ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD-314

Commander
US Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, MO 63120

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 5-4310-277-14	25 MAR 1976	COMPRESSOR, RECIPROCATING,AIR

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD-314

Commander
US Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, MO 63120

TEAR ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 5-4310-277-14	25 MAR 1976	COMPRESSOR, RECIPROCATING, AIR

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD-314

Commander
U.S. Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, MO 63120

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 diciliters = 33.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by
inches	centimeters	2.540
feet	meters	.305
yards	meters	.914
miles	kilometers	1.609
square inches	square centimeters	6.451
square feet	square meters	.093
square yards	square meters	.836
square miles	square kilometers	2.590
acres	square hectometers	.405
cubic feet	cubic meters	.028
cubic yards	cubic meters	.765
fluid ounces	milliliters	29.573
pints	liters	.473
quarts	liters	.946
gallons	liters	3.785
ounces	grams	28.349
pounds	kilograms	.454
short tons	metric tons	.907

To change	To	Multiply by
centimeters	inches	.394
meters	feet	3.280
meters	yards	1.094
kilometers	miles	.621
square centimeters	square inches	.155
square meters	square feet	10.764
square meters	square yards	1.196
square kilometers	square miles	.386
square hectometers	acres	2.471
cubic meters	cubic feet	35.315
cubic meters	cubic yards	1.308
milliliters	fluid ounces	.034
liters	pints	2.113
liters	quarts	1.057
liters	gallons	.264
grams	ounces	.035
kilograms	pounds	2.205
metric tons	short tons	1.102